Mathematics
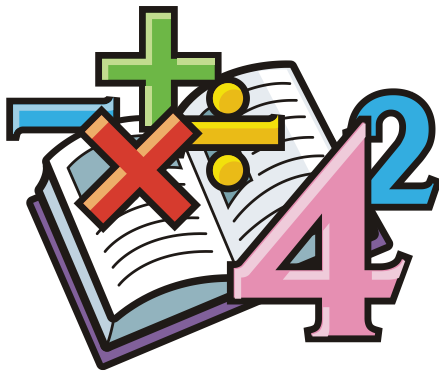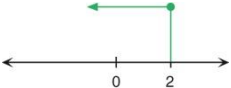
S.3 Mathematics Bridging Programme
Chapter 1 Linear Inequalities in One Unknown

Nouns	Verbs	Adjectives	Usages
Inequality 不等式			An <u>inequality</u> is a relation that holds between two values when they are different
Greater than 大於			x is <u>greater than</u> 4 $x > 4$
Less than 小於			x is <u>less than</u> 4 $x < 4$
Not less than 不小於			x is <u>not less than</u> 4 $x \geq 4$
Not greater than 不大於			x is <u>not greater than</u> 4 $x \leq 4$
Not equal to 不等於			x is <u>not equal to</u> 4 $x \neq 4$
Number line 數線			Express $x \leq 2$ on the <u>number line</u>
		Graphically 圖解法	Express $x \leq 2$ <u>graphically</u>.
Integer 整數		Integral	If $x < 2$ and x is an <u>integer</u>, find the greatest value of x.

Verbal Expressions and Calculation in Mathematics

1. Solve the <u>inequality</u> $5x - 9 \geq 16$, and express the answer on the <u>number line</u>.

2. (a) Solve the <u>inequality</u> $-3 < 5 - 2x$, and express the answer <u>graphically</u>.

   (b) If x is an <u>integer</u>, find the greatest value such that the <u>inequality</u> in (a) hold.

3. "If the sum of x and 1 is <u>not less than</u> 5, write down the <u>inequality</u> for the
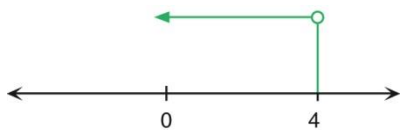
   relation.

Answers

1. $x \geq 5$

2. (a) $x < 4$

   (b) 3

3. $x + 1 \geq 5$

S.3 Mathematics Bridging Programme
Chapter 2 Percentage (II)

Nouns	Verbs	Adj.	Usages
Percentage change 百分變化			Percentage change $= \dfrac{\text{New Value - Original Value}}{\text{Original Value}} \times 100\%$ New value = 25 Original value = 20 Percentage change $= \dfrac{25-20}{20} \times 100\%$ $= 25\%$
Growth factor 增長因數			If a value P increases at a constant rate $r\%$ in each period, the factor $(1 + r\%)$ is called the growth factor
Decay factor 衰變因數			If a value P decreases at a constant rate $r\%$ in each period, the factor $(1 - r\%)$ is called the decay factor
Depreciation 折舊	Depreciate		The values of machines and electrical appliances decrease after they have been used. Such a drop in value is called depreciation
Depreciation rate 折舊率			The percentage decrease of depreciation is called the depreciation rate.
Principal 本金			The money deposited in a bank is called the principal.
Interest 利息			The extra amount of money the bank pays us after a certain period of time is called the interest.
Interest Rate 利率			The interest is calculated based on a certain percentage on the principal. Such percentage is called the interest rate.

Nouns	Verbs	Adj.	Usages
Deposit period 存款期			The period of time of the money deposited in a bank is called <u>deposit period</u>.
Annual interest rate (p.a.) 年利率			Interest Rate which is given on a yearly basis is called the <u>annual interest rate</u>.
Simple Interest 單利息			The interest which is based on a fixed principal is called <u>simple interest</u>.
Amount 本利和			The sum of the principal and the interest is called <u>amount</u>.
Compound interest 複利息			If the principal increases at a constant rate, the interest obtained in this way is called <u>compound interest</u>.
Compounded yearly/ half-yearly/ quarterly/ monthly 每年/每半年/每季/每月 計息一次			The compound interest <u>compounded</u> at different periods.
Rates 差餉			The tax which an owner of occupier of a property needs to pay to the government is called <u>rates</u>.

Nouns	Verbs	Adjec-tives	Usages
Rateable value 應課差餉租值			The rateable value of a property is the estimated annual rent of a property.
Property tax 物業稅			An owner of a property needs to pay property tax to the government if he rents out the property.
Salaries tax 薪俸稅			People who earn an income from their employment are required to pay salaries tax to the government.
Allowance 免稅額			Allowance is the level above which income tax is levied on an individual's annual income
Net chargeable income 應課稅入息實額			Net chargeable income = Total annoual income – allowance Annual income = \$300 000 Allowance = \$168 000 Netchargeable income = \$(300 000 – 168 000) = \$132 000

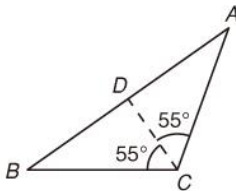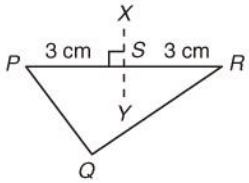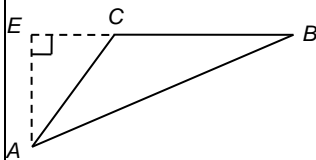# Verbal Expressions and Calculation in Mathematics

1. In a school, there are 800 students last year. Now, there are 1000 students. Find the <u>percentage change</u>.

2. Mr Cheung bought a car for $45 000. The value of the car <u>depreciates</u> at a rate of 20% per year.

   (a) Find its value 3 years later.

   (b) Hence, find the <u>depreciation</u>.

3. Mr Cheung deposits $8000 in a bank at 6% <u>p.a.</u>. Find the <u>simple interest</u> and the<u>amount</u> for 2 years.

4. Victor deposits $5000 in a bank at 10% <u>p.a.</u>. If the <u>interest</u> is <u>compounded yearly</u>,find the <u>amount</u> and the <u>compounded interest</u> after 3 years.

5. The <u>rateable value</u> of a flat is $90 000. If the <u>rates </u>are charged at 5% p.a., findthe <u>rates</u> payable per quarter.

6. The annual rental income of a flat is $180 000. If the <u>property tax </u>rate is 15%, how much <u>property tax</u> should the owner pay for a year?
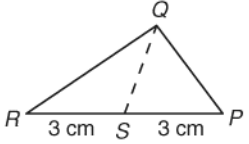
Answers

1. +25%

2. (a) $23 040   (b) $21 960

3. (a) $960, $8960

4. $6655, $1655

5. $1125

6. $21 600

S.3 Mathematics Bridging Programme
Ch.3 Special Lines and Centres in a Triangle

Nouns	Verbs	Adj.	Usages
angle bisector （角平分線）			 *CD* is the <u>angle bisector</u> of ∠*ACB* in △*ABC*.
perpedicular bisector （垂直平分線）			 *XY* is the <u>perpedicular bisector</u> of *PR* in △*PQR*.
altitude （高線）			 *AE* is the <u>altitude</u> of *BC* in △*ABC*.

Nouns	Verbs	Adj.	Usages
Median （中線）			 *QS* is the <u>median</u> of *RP* in △*PQR*.
Incentre（內心）			<u>Incentre</u> is the point of intersection of the three angle bisectors in a triangle.
inscribed circle （內切圓）			The incentre of a triangle is the centre of the largest circle that can be drawn in the triangle. The circle drawn is called the <u>inscribed circle</u>.
Circumcentre （外心）			<u>Circumcentre</u> is the point of intersection of the three perpedicular bisectors in a triangle.

Nouns	Verbs	Adj.	Usages
circumscribed circle （外接圓）			The circumcentre of a triangle is the centre of the circle which passes through the three vertices of the triangle. The circle drawn is called the circumscribed circle.
Centroid （形心）			Centroid is the point of intersection of the three medians in a triangle.
Orthocentre （垂心）			Orthocentre is the point of intersection of the three altitudes in a triangle.
Triangle Inequality （三角不等式）			Triangle Inequality The sum of the lengths of any two sides is greater than the length of the third side.

Verbal Expressions and Calculation in Mathematics

1. In the figure, *ABC* is a straight line.
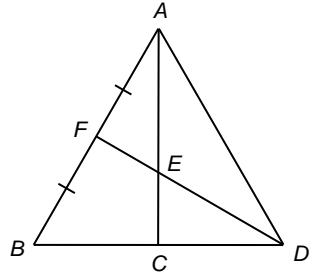   Prove that *DB* is the <u>angle bisector</u> of ∠*ADC* in △*ACD*.
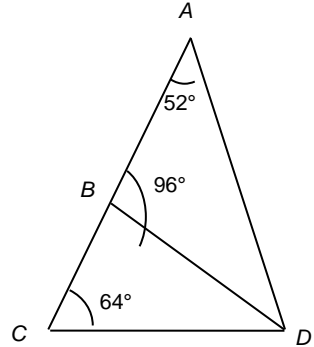
2. In the figure, *AC* and *DF* intersect at *E*.
   DF is the <u>median</u> of *AB* in △*ABD*.

   If △*ABC* ≅ △*DBF*, prove that

   AC is the <u>median</u> of *BD* in △*ABD*.

3. Match the descriptions with the centres of a triangle.

(a) The point of intersection •
of the three angle bisectors in a
triangle

(b) The point of intersection •   •Circumcentre
of the three altitudes in a
triangle.

(c) The point of intersection •   •   Incentre
of the three perpendicular
bisectors in a triangle.

(d) The point of intersection •   •   Orthocentre
of the three medians in a
triangle.

(e) The centre of the   •   •   Centroid
circumscribed circle   of a
triangle.

(f) The centre of the   •
inscribed circle of a triangle.

Answers

1.

In $\triangle BCD$,

$$\angle BDC + \angle BCD = \angle ABD \qquad \text{ext.} \angle \text{ of } \triangle$$

$$\angle BDC + 64° = 96°$$

$$\angle BDC = 32°$$

In $\triangle ACD$,

$$\angle ADC + \angle ACD + \angle CAD = 180° \qquad \angle \text{ sum of } \triangle$$

$$\angle BDC + \angle ADB + 64° + 52° = 180°$$

$$\angle ADB + 148° = 180°$$

$$\angle ADB = 32°$$

$\because \qquad \angle ADB = \angle BDC$

$\therefore \qquad$ **DB is the <u>angle bisector</u> of $\angle ADC$ in $\triangle ACD$.**

2.

$\because \triangle ABC \cong \triangle DBF \qquad$ given

$\therefore \quad AB = DB$ and $BC = BF \qquad$ corr. sides, $\cong \triangle$s

$\therefore \quad CD = BD - BC$

$\qquad = AB - BF$

$\qquad = AF$

$\because \quad AF = BF \qquad$ given

$\therefore \quad CD = BF$

$\qquad = BC$

$\therefore \qquad$ **AC is the <u>median</u> of BD in $\triangle ABD$.**

3.

(a) **Incentre**   (b) **Orthocentre**

(c) **Circumcentre**   (d) **Centroid**
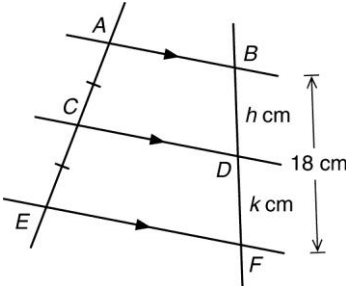
(e) **Circumcentre**   (f) **Incentre**

S.3 Mathematics Bridging Programme
Ch. 4 Quadrilaterals

Nouns	Usages
Quadrilateral （四邊形）	A polygon with four sides is called a <u>quadrilateral</u> .
Parallelogram （平行四邊形）	A <u>parallelogram</u> is a quadrilateral that has two pairs of parallel opposite sides.
Rectangle （長方形）	A <u>rectangle</u> is a parallelogram with four interior right angles.
Square （正方形）	A <u>square</u> is a parallelogram with four interior right angles and four equal sides.
Rhombus （菱形）	A <u>rhombus</u> is a parallelogram with four equal sides.
Trapezium （梯形）	A <u>trapezium</u> is a quadrilateral with only one pair of parallel opposite sides.
Right-angled trapezium （直角梯形）	A trapezium with one of its sides perpedicular to its bases is called a <u>right-angled trapezium</u>.

Nouns	Usages
Isosceles trapezium （等腰梯形）	A trapezium with non-parallel sides of equal lenrth is called an <u>isosceles trapezium</u>.
Kite （鳶形）	A <u>kite</u> is a quadrilateral with two pairs of equal adjacent sides.
Intercept （截距）	In the figure, the trasversal AE cuts three straight lines AB, CD and EF at points A, C and E respectively. AC is called the <u>intercept</u> made by AB and CD on AE.

Verbal Expressions and Calculation in Mathematics

1) In the figure, the perimeter of <u>quadrilateral</u> *PQRS* is 28 cm.

   (a) Find *x*.

   (b) Prove that *PQRS* is a <u>parallelogram</u>.

---
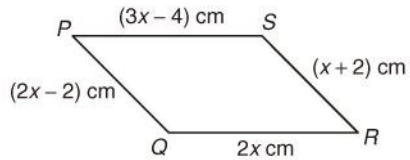
2) *ABCD* is a <u>rectangle</u>, find the unknowns in the figure.

---

3) *PQRS* is a <u>square</u>, find the unknowns in the figure.
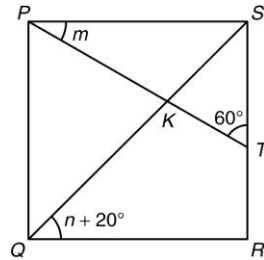
4. *WXYZ* is a <u>rhombus</u>, find the unknowns in the figure.
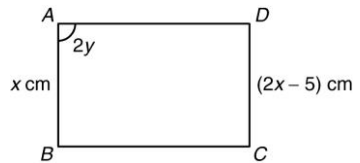
Answers

1.
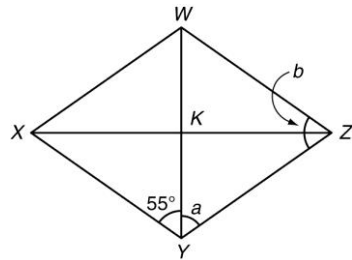
(a)
$$PQ + QR + RS + SP = 28$$
$$(2x-2) + 2x + (x+2) + (3x-4) = 28$$
$$8x - 4 = 28$$
$$8x = 32$$
$$x = \underline{\underline{4}}$$

(b)

$$PQ = [2(4) - 2]\,cm = 6\,cm$$
$$QR = 2(4)cm = 8\,cm$$
$$RS = (4+2) = cm = 6\,cm$$
$$SP = [3(4) - 4]cm = 8\,cm$$

$\because$ $PQ = RS$ and $QR = SP$
$\therefore$ $PQRS$ is a parallelogram. (opp. sides equal)

2.

$\because$ $AB = (DC)$ (property of rectangle)
$$x = 2x - 5$$
$\therefore$
$$x = \underline{\underline{5}}$$

$\because$ $\angle A = (90)°$ (property of rectangle)
$$2y = 90°$$
$\therefore$
$$y = \underline{\underline{45°}}$$

3.

$\because \angle PSR = 90\degree$ (property of square)

$\therefore$ $m + 90\degree + 60\degree = 180\degree$ ($\angle$ sum of $\triangle$)

$m = \underline{\underline{30\degree}}$

$\because$ $\angle SQR = 45\degree$ (property of square)

$n + 20\degree = 45\degree$

$\therefore$ $n = \underline{\underline{25\degree}}$

4.

$\because$ $\angle ZYW = \angle XYW$ (property of rhombus)

$\therefore a = \underline{\underline{55\degree}}$

$\angle XYZ + \angle WZY = 180\degree$

$55\degree + a + b = 180\degree$

$55\degree + 55\degree + b = 180\degree$

$b = \underline{\underline{70\degree}}$

S.3 Mathematics Bridging Programme
Ch. 5 More about 3- D Figures

Nouns	Verbs	Adjectives	Usages
Reflectional symmetry 反射對稱	Reflect	Reflectional, Symmetrical	The patterns on the back of some butterflies have <u>reflectional symmetry</u>.
Plane of reflection 反射平面	Reflect	Reflectional	A cube has 9 <u>planes of reflection</u>.
Rotational symmetry 旋轉對稱	Rotate	Rotational, Symmetrical	A figure repeat itself more than once when it rotates about a fixed point for one complete revolution, it is known to have <u>rotational symmetry.</u>
Axis of rotational symmetry 旋轉對稱軸			A right triangular prism has 4 <u>axes of rotational symmetry</u>
Regular tetrahedron 正四面體		Regular	A <u>regular tetrahedron</u> has 4 equal faces.
Regular octahedron 正八面體		Regular	A <u>regular octahedron</u> has 8 equal faces.
Net 摺紙圖樣			The figure shown is the <u>net</u> of a cube.

Nouns	Verbs	Adjectives	Usages
Orthographic views 三視圖			We can draw <u>orthographic views</u> to express the 2-D representation of a solid.
Front view 正視圖			<u>Front view</u> is a component of orthographic views.
Side view 側視圖			<u>Side view</u> is a component of orthographic views.
Top view 俯視圖			<u>Top view</u> is a component of orthographic views.
Sketch	Sketch 繪畫		<u>Sketch</u> the solid in the space provided.
Projection 投影	Project		When the image of an object is formed by rays of light on a screen, the image is called <u>projection</u>.
Line of intersection 交線	Intersect		PQ is the <u>line of intersection</u> of plane ABCD and plane EFGH.
Angle of intersection 交角	Intersect		∠QPR is the <u>angle of intersection</u> of ABEF and ABCD.

Verbal expressions and calculations in Mathematics

1. How many <u>planes of reflection</u> does a right triangular prism have?

   _____

2. How many <u>axes of rotational symmetry</u> does a right triangular prism have?

   _____

3. How many vertices does a <u>regular tetrahedron</u> have?

   _____

4. What are the three components of <u>orthographic views</u>.

   _____

5. What is the size of <u>angle of intersection</u> between two lateral surfaces in a cube?

   _____

Answers

1. There are 4 <u>planes of reflection</u>.

2. There are 4 <u>axes of rotational symmetry</u>.

3. There are 4 vertices.

4. The three components are <u>front view</u>, <u>side view</u> and <u>top view.</u>

5. The <u>angle of intersection</u> is 90º

S.3 Mathematics Bridging Programme
Ch. 6 Measures of Central Tendency

Nouns	Verbs	Adjectives	Usages
Central Tendency 集中趨勢			We can use a number to describe the <u>central tendency</u> of a set of data.
Datum/Data 數據			There are four <u>data</u>: 60cm, 62cm, 67cm, 71cm
Arithmetic Mean 算術平均數			<u>Arithmetic Mean</u> = (sum of data) ÷ (number of data)
Frequency 頻數		Frequent	<u>Frequency</u> is the number of times that a datum occurs.
Median 中位數			<u>Median</u> is the middle datum of a group of data when the data are arranged by magnitude.
Mode 眾數		Modal	<u>Mode</u> is the data with the highest frequency.
Modal Class 眾數組			<u>Modal class</u> is the group of data with the highest frequency.
Average 平均值			We can use mean, mode and median to find the <u>average</u> of a set of data.
Weight 權		Weighted	The <u>weight</u> of English marks is the highest in an examination because English is the most important subject.
Weighted Mean 加權平均數			<u>Weighted mean</u> = (sum of each datum multiplied by its weight) ÷ (sum of weights)

Verbal expressions and calculations in Mathematics

1. How many <u>data</u> are greater than 50kg?

   44kg, 38kg, 55kg, 60kg, 52kg, 47kg, 73kg, 61kg

---

2. Which <u>datum</u> has the lowest <u>frequency</u>?

   2, 2, 2, 3, 3, 3, 3, 3, 6, 6, 8, 8, 8

---

3. What is the <u>arithmetic mean</u> of the following set of data?

   1, 2, 3, 4, 5

---

4. What is the <u>median</u> of the following set of data?

   13, 14, 14, 18, 19, 25, 26

---

5. What is the <u>mode</u> of the following set of data?
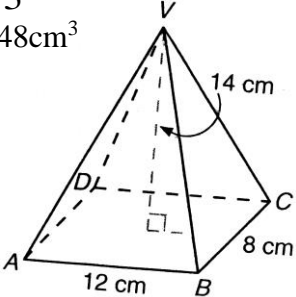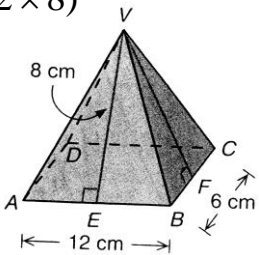
   $105, $0, $123, $105, $0, $69, $0, $123
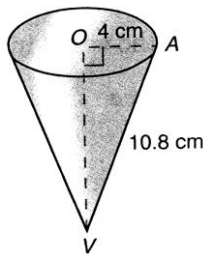
Answers
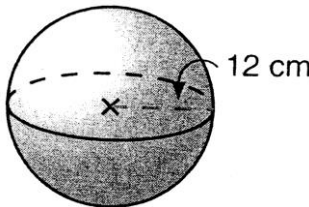
1. There 5 <u>data</u> which are greater than 50kg.

2. The <u>datum</u> '6' has the lowest <u>frequency</u>.

3. The <u>arithmetic mean</u> is 3.

4. The <u>median</u> is 18.

5. The <u>mode</u> is $0.
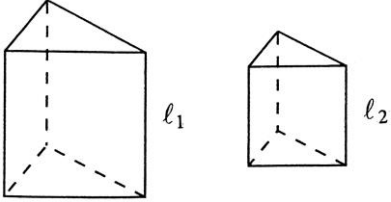
S.3 Mathematics Bridging Programme

Chapter 7 Areas and volumes

Nouns	Verbs	Adjectives	Usages
Pyramid（錐體） Volume（體積） Base area（底面積） Height（高）			Volume of a pyramid $= \dfrac{1}{3} \times$ Base area $\times$ Height In the figure, Volume $= \dfrac{1}{3} \times (12 \times 8) \times (14)$ $=448\text{cm}^3$ 14 cm · D · C · 8 cm · A · 12 cm · B · V
Lateral face （側面）			Area of the Lateral face VAB $= \dfrac{1}{2} \times (12 \times 8)$ $=48\text{cm}^2$ 8 cm · D · C · F · 6 cm · A · E · B · 12 cm · V

Nouns	Verbs	Adjectives	Usages
Frustum （平截頭體）			In the <u>frustum</u> shown, $$\frac{VP}{VQ} = \frac{VG}{VC}$$
Circular Cone （圓錐體） Radius （半徑）		Circular （圓的）	Volume of a <u>circular cone</u> $$= \frac{1}{3} \times \pi \times (\underline{radius})^2 \times height$$ In the figure, volume $$= \frac{1}{3} \times (\pi \times 6^2) \times 13$$ $=156\pi \text{cm}^3$

Nouns	Verbs	Adjectives	Usages
Surface area （表面面積） Slant height （斜高）		Curved （曲的） Slant （斜的）	<u>Curved surface area</u> $= \pi \times$ *Base radius* $\times$ <u>*Slant height*</u> In the figure, curved surface area $= \pi \times (4) \times (10.8)$ $= 43.2\pi\,\text{cm}^2$

Nouns	Verbs	Adjectives	Usages
Sphere （球體） Hemisphere （半球體）			Volume of <u>sphere</u> $$= \frac{4}{3} \times \pi \times (radius)^3$$ Volume of <u>hemisphere</u> $$= \frac{2}{3} \times \pi \times (radius)^3$$ In the figure, Volume of the sphere $$= \frac{4}{3} \times \pi \times (12)^3$$ $=2304\pi \mathrm{cm}^3$ Volume of hemisphere $$= \frac{2}{3} \times \pi \times (12)^3$$ $=1152\pi \mathrm{cm}^3$ <u>Surface area</u> of sphere $$= 4\pi \times (radius)^2$$ <u>Surface area</u> of the above sphere $$= 4\pi \times (12)^2$$ $=576\pi \mathrm{cm}^3$ 12 cm

Nouns	Verbs	Adjec-tives	Usages
Similar Figures （相似圖形） Length （長度） Area （面積） Volume （體積） Ratio （比）		Corresponding （對應的）	For two <u>similar figures,</u> 1. the <u>ratio</u> of the area of their <u>corresponding</u> surfaces is equal to the square of the ratio of any pair of corresponding sides (or line segments). 3. the <u>ratio</u> of their <u>volumes</u> is equal to the cube of the ratio of any pair of corresponding sides (or line segments). Refer to following figures, Volume V_1 Volume V_2 Surface area A_1 Surface area A_2 $$\frac{A_2}{A_1} = \left(\frac{l_2}{l_1}\right)^2 \text{ and } \frac{V_2}{V_1} = \left(\frac{l_2}{l_1}\right)^3$$

Verbal Expressions and Calculation in Mathematics

1. The figure shows a pyramid *VABCD* with a square base *ABCD* of side 5 cm. If the height of the pyramid is 9 cm, find the volume of the pyramid.

_____

_____

_____

_____
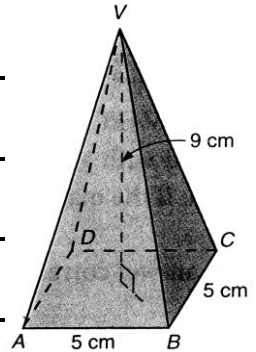
2. Find the total surface area of the following right circular cone in terms of π.

_____

_____

_____

_____
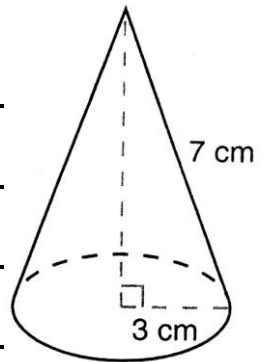
3. The figure shows a right <u>circular cone</u> which is fully filled with ice cream. The top part of the ice cream is in the shape of a <u>hemisphere</u>. If the radius of the hemisphere and the height of the circular cone are 3 cm and 9 cm respectively, find the volume of the ice cream in terms of π.
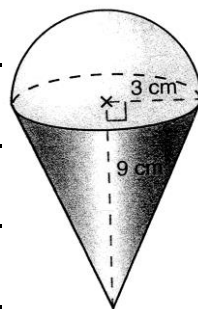
4. The radius of a solid <u>hemisphere</u> is 9 cm. Find the <u>total surface area</u> of the solid in terms of π.

5. Find the unknown in the following pairs of <u>similar solids</u>.

15 cm

9 cm

volume = y cm³

volume = 81 cm³
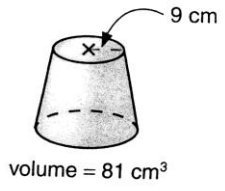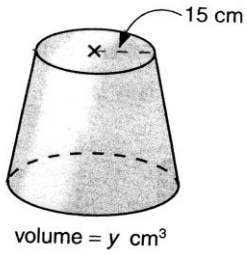
Answers

1. Volume $= 75 cm^3$

2. Total surface area $= 30\pi\, cm^2$

3. Volume $= 45\pi\, cm^3$
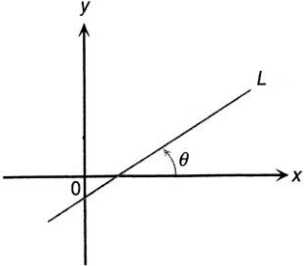
4. Total surface area $= 243\pi\, cm^2$
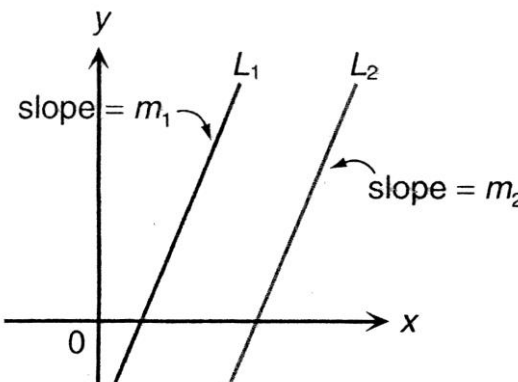
5. $y = 375$
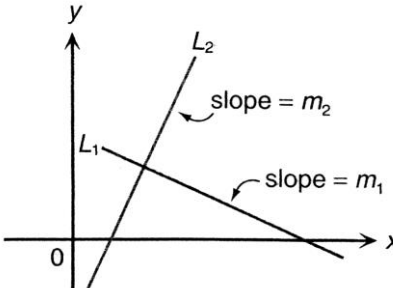
S.3 Mathematics Bridging Programme
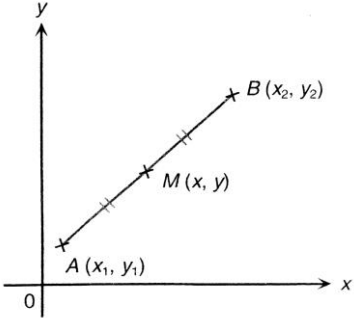
Ch.8 Co-ordinate Geometry of Straight Lines
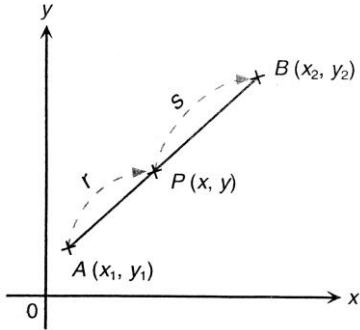
Nouns	Verbs	Adjectives	Usages
Distance（距離）Formula（公式）			Distance between (x_1, y_1) and (x_2, y_2) $$= \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$ Distance between (3, 5) and (6, 9) $$= \sqrt{(6-3)^2 + (9-5)^2}$$ $$= 5$$
Slope Gradient（斜率）			Slope of the line joining (x_1, y_1) and (x_2, y_2) $$= \frac{y_2 - y_1}{x_2 - x_1}$$ Gradient of the line joining $(-3, 1)$ and $(1, 4)$ $$= \frac{4-1}{1-(-3)}$$ $$= \frac{3}{4}$$

Nouns	Verbs	Adjectives	Usages
Inclination（傾角）			In the figure, θ is the <u>inclination</u> of L. tanθ =slope of L If slope of L is $\sqrt{3}$, tanθ $= \sqrt{3}$, θ = 60° the <u>inclination</u> of L is 60°

Nouns	Verbs	Adjectives	Usages
		Parallel （平行）	If $m_1 = m_2$, then L$_1$ is parallel to L$_2$

Nouns	Verbs	Adjectives	Usages
		Perpendicular （垂直）	If $m_1 \times m_2 = -1$, then L$_1$ is perpendicular to L$_2$

Nouns	Verbs	Adjectives	Usages
Mid-point formula （中點公式）			In the figure, the <u>mid-point</u> M is $$\left(\frac{x_1+x_2}{2}, \frac{y_1 + y_2}{2} \right)$$ The <u>mid-point</u> of (2,3) and (4,5) is $$\left(\frac{2+4}{2}, \frac{3+5}{2} \right) = (3,4)$$

Nouns	Verbs	Adjectives	Usages
Section formula （截點公式） Point of division （分點）		Internal （內部的）	In the figure, P is the <u>internal point of division</u> of the line segment AB. P is the point $$\left(\frac{sx_1+rx_2}{r+s}, \frac{sy_1+ry_2}{r+s}\right)$$ Given a line segment AB where A is (2,1) and B is (5,−2). The <u>internal point of division</u> N such that AN : NB = 1 : 2 is $$\left(\frac{2(2)+1(5)}{1+2}, \frac{2(1)+1(−2)}{1+2}\right)$$ $= (3,0)$

Verbal Expressions and Calculation in Mathematics

1. Find the <u>distance</u> between the two points (−2,3) and (3,15).

2. Find the <u>slope</u> of the line joining (−1,5), (2,11).

3. Given that the <u>gradient</u> of a line L is 1. Find the <u>inclination</u> of the line L.

4. Find the <u>mid-point</u> of the line joining A(3,5), B(−5,1).

_____

_____

5. Given two points A(5,−2), B(3,4). Find the <u>internal</u> <u>point of division</u> N of AB that AN : NB = 2 : 3 .

_____

_____

Answers

1. Distance $= \sqrt{[3-(-2)]^2 + (15-3)^2} = 13$

2. Slope $= \dfrac{11-5}{2-(-1)} = 2$

3. $\tan\theta = 1$

   $\theta = 45°$

   $\therefore$ The inclination of L is $45°$

4. The mid-point of AB is $\left(\dfrac{3+(-5)}{2}, \dfrac{5+1}{2}\right)$
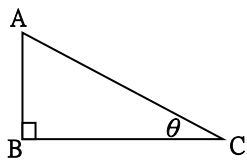
   $= (-1,3)$
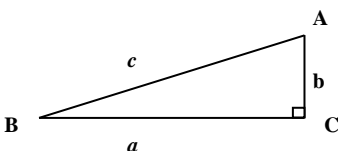
5. N is $\left(\dfrac{3(5)+2(3)}{2+3}, \dfrac{3(-2)+2(4)}{2+3}\right)$

   $= \left(\dfrac{21}{5}, \dfrac{2}{5}\right)$

S.3 Mathematics Bridging Programme

Chapter 9 Trigonometric Relations

Nouns	Verbs	Adjectives	Usages
Trigonometric Identity 三角恆等式			Prove the following <u>trigonometric identity</u>. $$\dfrac{\tan\theta\cos\theta}{\sin\theta} \equiv 1$$
Complementary Angles 餘角			30° and 60° are <u>complementary angles</u>.
Opposite Side 對邊			
Adjacent Side 鄰邊			
Hypotenuse 斜邊			In the figure, AB is the <u>opposite side</u> of θ. BC is the <u>adjacent side</u> of θ. AC is the <u>hypotenuse</u>.
Acute Angle 銳角			Find the <u>acute angle</u> θ correct to the nearest 0.1°. $\sin\theta = 0.456$
Right-angled Triangle 直角三角形			Construct a <u>right-angled triangle</u> *ABC* with $\angle C = 90°$.

Nouns	Verbs	Adjectives	Usages
Pythagoras' Theorem 畢氏定理			In the figure, $a^2 + b^2 = c^2$. It is called the <u>Pythagoras' Theorem</u>.
Fraction 分數			It is given that $\cos\theta = 0.8$, where θ is an acute angle. Find the value of $\sin\theta$ without evaluating θ. (Give your answer in <u>fraction</u>).
Surd Form 根式			Find the values of $\cos\theta$ and $\tan\theta$ if $\sin\theta = 0.25$. Leave your answers in <u>surd form</u>.
	Determine 決定		<u>Determine</u> whether the following is an identity. $\sin^2\theta - \cos^2\theta = \sin\theta - \cos\theta$

Verbal Expressions and calculation in Mathematics

1. Find the <u>acute angle</u> θ in the following equation.
$$\sin\theta = \frac{\tan 45°}{\sin 45° + \cos 45°}$$

2. In the following equation, θ represents an <u>acute angle</u>, find the other two trigonometric ratios by constructing a <u>right-angled triangle</u>.
$$\sin\theta = \frac{1}{4}$$

3. Prove the following <u>trigonometric identity</u>.
$$\frac{(1-\cos\theta)(1+\cos\theta)}{\cos^2(90°-\theta)} \equiv 1$$

4. Using <u>Pythagoras' Theorem</u>, find the <u>hypotenuse</u> of $\triangle ABC$ and $\angle ABC$.
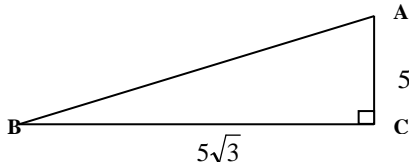
5. Referring to the figure, find the lengths of the following line segments without using a calculator. (Leave your answers in <u>surd form</u>.)
   (a) AC (b) DC
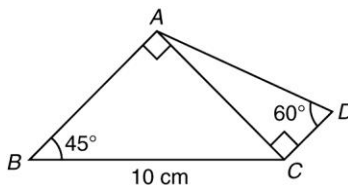
Answers

1. $\theta = 45°$

2. $\cos\theta = \dfrac{\sqrt{15}}{4}$, $\tan\theta = \dfrac{1}{\sqrt{15}}$

3. LHS $= \dfrac{(1-\cos\theta)(1+\cos\theta)}{\cos^2(90°-\theta)} = \dfrac{1-\cos^2\theta}{\sin^2\theta} = \dfrac{\sin^2\theta}{\sin^2\theta} = 1$

   RHS $= 1$

   $\because$ LHS $=$ RHS

   $\therefore \dfrac{(1-\cos\theta)(1+\cos\theta)}{\cos^2(90°-\theta)} \equiv 1$

4. AB

   $= \sqrt{5^2 + (5\sqrt{3})^2}$ (pyth thm)

   $= 10$

   $\tan\angle ABC = \dfrac{5}{5\sqrt{3}} = \dfrac{1}{\sqrt{3}}$

   $\angle ABC = 30°$

5. (a) Consider $\triangle ABC$.

   $\sin 45° = \dfrac{AC}{BC}$

   $AC = BC\sin 45° = 10 \times \dfrac{\sqrt{2}}{2} = 5\sqrt{2}$ cm
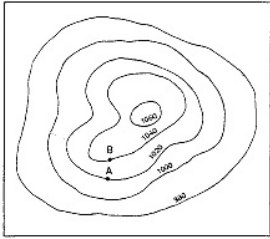
   (b) Consider $\triangle ACD$.
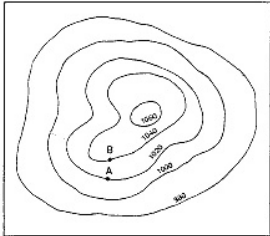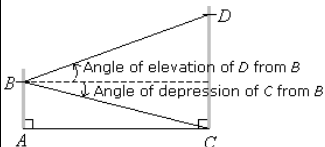
   $\tan 60° = \dfrac{AC}{DC}$
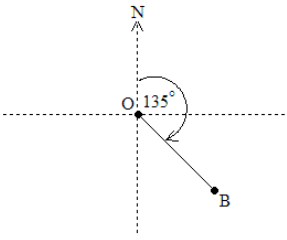
   $DC = \dfrac{AC}{\tan 60°} = \dfrac{5\sqrt{2}}{\sqrt{3}}$ cm

S.3 Mathematics Bridging Programme

Chapter 10 Applications of Trigonometry

Nouns	Verbs	Adjectives	Usages
Gradient 斜率			The measurement of <u>gradients</u> is used in the construction of roads to describe how steep the roads are.
Vertical Distance 鉛垂距離			The ratio 1 : 6 means that when the change in <u>vertical distance</u> is 1 unit, the change in <u>horizontal distance</u> is 6 units.
Horizontal Distance 水準距離			
Inclination 傾角			If the <u>inclination</u> of a road is θ, then $\tan\theta$ is the ratio of vertical distance between any two points on the road and horizontal distance between those two points on the road.
Inclined Plane 斜面			If the gradients of <u>inclined planes</u> AB and CD are $\dfrac{1}{3}$ and $\dfrac{1}{4}$ respectively, which of the planes is steeper?
Contour Map 等高線地圖			The following figure shows the <u>contour map</u> of a hill. Figure E-1: Isolated Hill

Contour Line 等高線			The curves marked with 980 m, 1000 m, 1020 m, 1040 m and 1060 m are called <u>contour lines</u>. Figure E-1: Isolated Hill
Angle of Elevation 仰角			When we see an object above us, the angle between our line of sight and the horizontal is called the <u>angle of elevation</u>.
Angle of Depression 俯角			When we see an object below us, the angle between our line of sight and the horizontal is called the <u>angle of depression</u>.
Eye Level 視線高度			<u>Eye level</u> refers to the height a viewer's eyes are positioned in relation to the ground.

Bearing 方位角			The direction of a point relative to another point is called <u>bearing</u>.
True Bearing (also called Whole Circle Bearing) 真方位角			When using the <u>true bearing</u>, directions are measured from the north in a clockwise direction. For example, the <u>true bearing</u> of B from O in the diagram is $135°$.
Compass Bearing (also called Reduced Bearing) 羅盤方位角			When using the compass bearing, directions are measured from the north or the south. For example, the <u>compass bearing</u> of B from O in the above diagram is $S45°E$.
Shortest Route 最短路線			A man walks 4 km due north from A to B, and then walks 5 km due east to C. If he wants to return to A by the <u>shortest route</u>, which <u>direction</u> should he take?
Direction 方向			

Verbal Expressions and calculation in Mathematics

1. The figure shows a path AB of <u>gradient</u> $\dfrac{1}{8}$ and a staircase AC of <u>inclination</u> $45°$. If point A is 4 m above the horizontal ground BDC, find the distance between B and C.
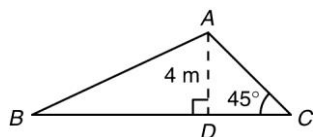
2. In the figure, the scale of the <u>contour map</u> is 1 : 20 000. PQ is a straight road, where P is on the <u>contour line</u> 250 m and Q is on the <u>contour line</u> 400 m. PQ is measured to be 1.5 cm on the map.
   (a) Find the <u>gradient</u> of road PQ in the form $1 : n$.
   (b) Find the <u>inclination</u> of road PQ, correct to the nearest $0.01°$.
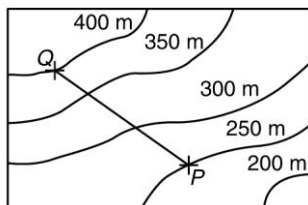
scale 1: 20 000

3. In the figure, Raymond's <u>eye level</u> is 1.5 m above the ground. A balloon C is fixed at 50 m vertically above the ground. If the <u>horizontal distance</u> BD between Raymond and the balloon is 28 m, find the <u>angle of elevation</u> of the balloon C from his eye at A correct to 3 significant figures.
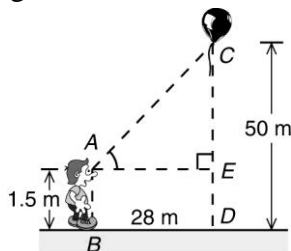
4. In the figure, Cherie runs for 100 m from A to B at a <u>bearing</u> of N33°E. Then she runs for 80 m to C at a bearing of S57°E.
(a) Find the distance between A and C.
(b) Find the <u>compass bearing</u> of C from A.
(Give your answers correct to 3 significant figures.)
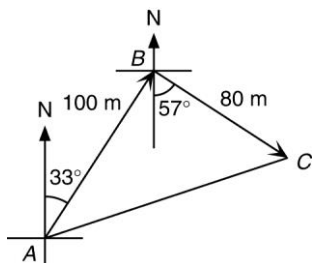
Answers

1. $\because$ Gradient of path $AB = \dfrac{AD}{BD}$

$$\frac{1}{8} = \frac{4\text{ m}}{BD}$$

$\therefore \qquad\qquad BD = 32\text{ m}$

Consider $\triangle ACD$.

$$\tan 45° = \frac{AD}{DC}$$

$$1 = \frac{4\text{ m}}{DC}$$

$$DC = 4\text{ m}$$

$\therefore$ Distance between B and C
$$= BD + DC = 32 + 4 = 36\text{ m}$$

2. (a) Vertical distance of $PQ = (400 - 250)\text{ m} = 150\text{ m}$
   Since the scale of the map is 1 : 20 000,
   $\therefore$ horizontal distance of $PQ = 1.5 \times 20\,000\text{ cm}$
   $$= 30\,000\text{ cm}$$
   $$= 300\text{ m}$$
   $\therefore$ Gradient of road $PQ = \dfrac{150\text{ m}}{300\text{ m}} = \dfrac{1}{2} = 1:2$

   (b) Let θ be the inclination of road PQ.
   $$\therefore \quad \tan\theta = \frac{1}{2}$$
   $$\theta = 26.57° \text{ (corr. to the nearest } 0.01°)$$
   $\therefore$ The inclination of road PQ is $26.57°$.

3. $ED = AB = 1.5\,\text{m}$
   $AE = BD = 28\,\text{m}$
   Consider right-angled triangle AEC.

   $$\begin{aligned}
   \tan \angle CAE &= \frac{CE}{AE} = \frac{CD - ED}{AE} \\
   &= \frac{(50 - 1.5)\,\text{m}}{28\,\text{m}} \\
   &= \frac{48.5}{28}
   \end{aligned}$$

   $\angle CAE = 60.0°$ (corr. to 3 sig. fig.)

   $\therefore$ The angle of elevation of the balloon C from his eye
   at A is $60.0°$.

4. (a) With the notations in the figure,

   $\angle EBA = \angle DAB$ (alt. $\angle$s, EB // AD) $= 33°$

   $\angle ABC = \angle ABE + \angle EBC = 33° + 57° = 90°$

   Consider $\triangle ABC$.

   $$\begin{aligned}
   AC &= \sqrt{AB^2 + BC^2} \quad \text{(Pyth. theorem)} \\
   &= \sqrt{100^2 + 80^2}\,\text{m} \\
   &= \sqrt{16\,400}\,\text{m} \\
   &= 128\,\text{m} \quad \text{(corr. to 3 sig. fig.)}
   \end{aligned}$$
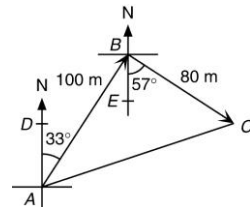
   $\therefore$ The distance between A and C is $128\,\text{m}$.

   (b) Consider $\triangle ABC$.

   $$\tan \angle BAC = \frac{BC}{AB} = \frac{80\,\text{m}}{100\,\text{m}}$$

   $\angle BAC \approx 38.66°$

   $\angle DAC = \angle DAB + \angle BAC \approx 33° + 38.66°$

   $\qquad\qquad = 71.7°$ (corr. to 3 sig. fig.)
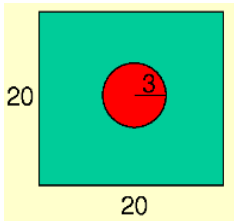
   $\therefore$ The compass bearing of C from A is N71.7°E.

S.3 Mathematics Bridging Programme

Chapter 11 Introduction to Probability

Nouns	Verbs	Adjectives	Usages
Event 事件			A card is drawn from 52 playing cards. "A green heart is obtained" is an example of an <u>event</u>.
Probability 概率			The chance of occurrence of an event is represented by a number known as the <u>probability</u> of the event. For example, if a dice is thrown, the <u>probability</u> of getting an even number is $\dfrac{3}{6} = \dfrac{1}{2}$.
Possible Outcome 可能結果			When we randomly choose a letter from the word "TOSS" and obtain a vowel, the <u>possible outcomes</u> are "T", "O", "S" and "S".
Favourable Outcome 合適結果			When we randomly choose a card from a pack of 52 playing cards and obtain a black face card, the <u>favourable outcomes</u> are club J, club Q, club K, spade J, spade Q and spade K.
Equally Likely Outcome 等可能結果			If the coin is fair, both a "Head" and a "Tail" have equal chance to be obtained. In this case, the two outcomes are called <u>equally likely outcomes</u>.
Sample Space 樣本空間			The collection of all possible outcomes is called the <u>sample space</u>.

Impossible Event 不可能事件			When we throw a dice, "getting a number greater than 7" is an <u>impossible event</u>.
Certain Event 必然事件			When we throw a dice, "getting a number less than 7" is a <u>certain event</u>.
Tree Diagram 樹形圖			When we have a box with two red, two white and two green balls and two balls are drawn from the box randomly, the possible combination of outcomes can be listed by the following <u>tree diagram</u>.
Table 表			When three coins are tossed, the possible combination of outcomes can be listed by the following <u>table</u>.

Geometric Probability 幾何概率			When a dart is thrown at random and the dart hits the dartboard, what is the <u>geometric probability</u> that it will land in the circle? 20 ... 3 ... 20
Theoretical Probability 理論概率			When a fair coin is tossed, the head or the tail is equally likely to show up. The <u>theoretical probability</u> for the head to show up equals to $\frac{1}{2}$.
Experimental Probability 實驗概率			If we toss a coin 50 times and a head shows up 23 times, then we say that the <u>experimental probability</u> of a head showing up is $\frac{23}{50}$.
Expected Value 期望值			When we throw a dice once, the <u>expected value</u> of the number obtained equals to $$\frac{1}{6}\times1+\frac{1}{6}\times2+\frac{1}{6}\times3+\frac{1}{6}\times4+\frac{1}{6}\times5+\frac{1}{6}\times6$$ $$=3.5$$ It means that, if we throw the dice many times, the mean number we obtain should be close to the theoretical value 3.5.

Verbal Expressions and calculation in Mathematics

1. If a card is drawn at random from a pack of 52 playing cards, find the <u>probability</u> of getting a face card.

2. There are two questions in a quiz. The first one offers 3 options, of which only one is correct. The second one is a true-or-false question. If Peter chooses his answers at random, list all the <u>possible outcomes</u> by a <u>tree diagram</u>.

3. Box *A* contains 4 balls, including a red, a yellow, a green and a blue one. Box *B* contains 3 balls, including a red, a blue and a white one. If a ball is drawn from each of the boxes, list all the <u>possible outcomes</u> in a <u>table</u>.

4. The figure shows a lucky wheel. Each participant has one spin of the wheel and wins the prize where the pointer stops. If Kelvin spins the wheel once, find the <u>probabilities</u> of winning
   (a) no prizes,
   (b) a school bag.
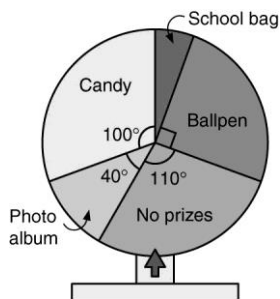
5. A dice is thrown 200 times and the results are shown below:

Possible outcome	1	2	3	4	5	6
Frequency	36	$4x + 3$	30	34	$3x$	$4x - 2$

(a) Find x.

(b)(i) Find the <u>theoretical probability</u> of getting a prime
number.

  (ii) Find the <u>experimental probability</u> of getting a
prime number.

6. The figure shows a dartboard formed by 3 squares of sides 3 cm, 4
cm and 12 cm respectively. If a dart is thrown and hits the red region,
a prize of $720 is awarded. No prize is awarded when hitting the
other regions. John throws a dart at random and the dart hits the
dartboard. Find the <u>expected value</u> of the prize in one throw.
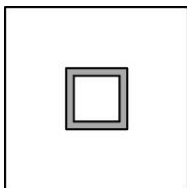
Answers

1. $P(\text{getting a face card}) = \dfrac{12}{52} = \dfrac{3}{13}$

2. Let A, B and C stand for 3 options of the first question and T, F stand for the two options of second question. Assume that the correct answers for the two questions are A and T respectively. The tree diagram:

First question	Second question	Possible Outcomes
A	T	A, T
A	F	A, F
B	T	B, T
B	F	B, F
C	T	C, T
C	F	C, F
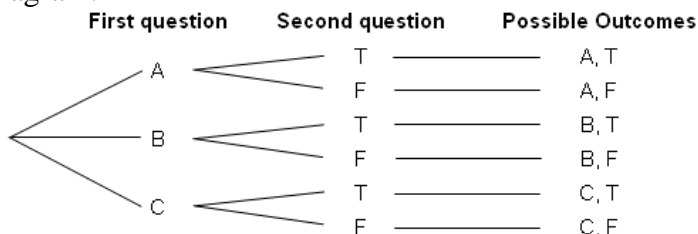
3. Let R stand for the red ball, Y stand for the yellow ball, G stand for the green ball, B stand for the blue ball and W stand for the white ball. The table:

		2nd ball drawn	
	R	**B**	**W**
R	RR	RB	RW
Y	YR	YB	YW
G	GR	GB	GW
B	BR	BB	BW

1st ball drawn

4. (a) $P(\text{no prizes}) = \dfrac{\frac{11}{36}\pi r^2}{\pi r^2} = \dfrac{11}{36}$

(b) $P(\text{a school bag}) = \dfrac{\frac{1}{18}\pi r^2}{\pi r^2} = \dfrac{1}{18}$

5. (a) $36 + (4x + 3) + 30 + 34 + 3x + (4x - 2) = 200$
$$11x + 101 = 200$$
$$x = 9$$

(b)(i) Theoretical probability of getting a prime number
$$= \frac{3}{6} = \frac{1}{2}$$

(ii) Experimental probability of getting a prime number
$$= \frac{96}{200} = \frac{12}{25}$$

6. Area of the dartboard $\quad 12^2$ cm$^2 \quad$ 144 cm^2
Area of the red region $\quad (4^2 - 3^2)$ cm$^2 \quad$ 7 cm^2

$\therefore$ P(hitting the red region) $= \dfrac{7\,\text{cm}^2}{144\,\text{cm}^2}$

$$= \frac{7}{144}$$

$\therefore$ Expected value of the prize in one throw

$= \$720 \times \dfrac{7}{144} + \$0 \times P(\text{hitting the white region})$

$= \$35 + \$0$

$= \$35$

Geography

My reading record: (Please fill in the date of reading)

Module 9 :Taming the sand			
Unit	Content	Date	Remarks
9.1	What are deserts? Where do we find them?		
9.2	What is desertification? What is sandstorm?		
9.3	How is China affected by desertification?		
9.4	How do sandstorms affect us?		
9.5	What can be done to solve the problem of desertification in China		
9.6	What can we learn from the experience of other countries/ regions in the world?		

Module 6: Global shift in manufacturing industry			
Unit	Content	Date	Remarks
6.1	What is the manufacturing industry?		
6.2	Where have our factories gone?		
6.3	Does the shift in manufacturing activity occur in other places?		
6.4	What are the pros and cons of the global shift in manufacturing activity?		
6.5	Can industrial development be more sustainable?		
4.5	What are the UK and Bangladesh doing to cope with their water problems?		

In doing activities or exercises, you often need to answer questions. Before you can answer a question, you need to first understand what it means.

Some words or phrases in a question tell us what we need to answer. The following are some examples. *You will come across them in studying geography.*

Word or phrase	What we need to answer?	Example
Name / Identify (寫出名稱 / 辨認)	● Write down the name of something. 寫出某物件的名稱 ● No need to write complete sentence. 不需要以完整的句子作答 ● No need to explain. 不需解釋	**Q**: Name two examples of natural hazards in Hong Kong. **A**: Landslides and typhoons.
State / Write down (指出 / 寫出)	● Give a short answer. 簡短地作答 ● No need to explain. 不需解釋	**Q**: Write down the unit of temperature. **A**: Degree Celsius (°C)
List (列出)	● Write down a number of things that belong to the same kind. 寫出一些相類似的項目	**Q**: List two urban problems. **A**: Pollution and traffic congestion.
Explain / Why (解釋 / 為甚麼)	● Give reasons or the principle behind something. 寫出原因或原理 ● Usually, a detailed answer is needed. 需要詳細作答	**Q**: Explain why the Philippines is frequently hit by typhoons. **A**: It is located on warm, tropical waters. Typhoons usually hit the Philippines first in their tracks.

Suggest / Try to think of (建議 / 試想出)	● Give ideas. 寫出構想	**Q**: Suggest one way to protect oceans. **A**: The government can set up laws to stop overfishing.
What do you think? (你有甚麼意見)	● Give opinion about something. 寫出意見	**Q**: Some people think that we should stop eating shark fins (魚翅). What do you think? **A**: I agree. Sharks are hunted for their fins. We can protect sharks if we stop eating shark fins.
Describe / **How …** (描述 / 怎樣)	● Give the details of something. 寫出詳細的描述 ● No need to explain. 不需解釋	**Q**: Describe the road conditions in Central in the daytime. **A**: In the daytime, roads are congested with people and cars.
Calculate (計算)	● Find the value and give the correct unit. 計算出答案，並加上合適的單位	**Q**: Calculate the percentage change in average vehicle speed. **A**: % change= $\dfrac{\text{New value} - \text{Old value}}{\text{Old value}}$
Compare (比較)	● Give similarities and differences between different items. 找出各項相似點和不同之處	**Q**: Compare the population density of Hong Kong and Guangzhou. **A**: Hong Kong has a higher population density than Guangzhou.

Module 9 Taming the sand: A long-last combat against desertification and sandstorms					
Unit 9.1 What are deserts 荒漠? Where do we find them?					
Vocabularies	**n**	**v**	**a**	**ad**	**Sentences**
What are deserts? Where are they?					
annual rainfall 年雨量	√				➢ Deserts are dry areas with an annual rainfall of less than 250mm.
Tropical of Cancer 北回歸線	√				
Tropical of Capricorn 南回歸線	√				➢ The largest desert in the world is the _____Desert in Africa, while in China, the largest desert is the _____ Desert in Xinjiang 新疆.
tropical desert 熱帶荒漠	√				
Sahara Desert 撒哈拉沙漠	√				
Great Australian Desert 澳大利亞沙漠	√				
Arabian Desert 阿拉伯沙漠	√				
Somali Desert 索馬裏沙漠	√				
Atacama Desert 阿塔卡瑪沙漠	√				
Namib Desert 納米比沙漠	√				

Vocabularies	n	v	a	ad	Sentences
Kalahari Desert 喀拉哈裏沙漠	√				➤ _____ deserts lie near the Tropical of Cancer and the Tropic of _____ ➤ _____- deserts are found in higher latitudes.
temperate desert 溫帶荒漠	√				
Takla Makan Desert 塔克拉瑪幹沙漠	√				
Gobi Desert 戈壁沙漠	√				
Patagonian Desert 巴塔哥尼亞沙漠	√				
Tukestan Desert 土耳其斯坦沙漠	√				
Thar Desert 塔爾沙漠	√				

What are the characteristics of deserts?					
Vocabularies	**n**	**v**	**a**	**a d**	**Sentences**
Daily range of temperature 日溫差	√				➢ Rain in deserts is scarce and _____
Unreliable 不可靠					➢ Clouds are rare in deserts. With high daytime temperature and low temperature at night, the
Scarce 缺乏			√		
sandstorms 沙塵暴	√				_____ _____- is large.
dust storm 塵暴	√				
Cactus 仙人掌	√				➢ Winds are strong in deserts, and thus
bark 樹皮	√				_____ or
oases 綠洲	√				dust storms will occur.
water table 地下水位	√				➢ _____plant have fleshy stems for storing water.
					➢ _____can be found in the areas where the water table meets the surface of a desert.

Module 9 Taming the sand: A long-last combat against desertification and sandstorms

Unit 9.2 What id desertification ? what is a sandstorm?

Vocabularies	n	v	a	ad	Sentences
What is desertification?					
evaporation rate 蒸發率	√				➢ _____ are places with low rainfall and high _____rates. ➢ The process of land _____in these drylands is called desertification.
Dryland 旱地	√				
productivity 生產力	√				
land degradation 土地退化	√				
Semi-desert 半荒漠	√				
Grassland 草原	√				
Savanna 熱帶稀樹草原	√				

Where are the major desertified areas in the world?					
Vocabularies	**n**	**v**	**a**	**ad**	**Sentences**
Threaten 威脅		√			➢ Desertification is serious in the＿＿＿＿＿＿ in Africa.
arable land 可耕地	√				
Sahel 薩赫勒	√				

What are sandstorms?

	n	v	a	ad	
severe 嚴重			√		➢ Sandstorm is a ＿＿＿＿＿＿ windstorm that ＿＿＿＿＿＿ clouds of dust or sand across an＿＿＿＿＿＿ area.
Windstorm 風暴	√				
sweeps 刮起		√			
Extensive 廣大			√		
availability 可利用性	√				
loose 鬆散	√	√	√		➢ Without vegetation cover, topsoil is easily exposed.
topsoil 表土	√				
Exposed 暴露		√			➢ The major difference between sandstorm and duststorm is about the size of ＿＿＿＿＿＿
Golmud 格爾木	√				
Qinghai 青海	√				
Particles 顆粒	√				

What is the global distribution of sandstorms?					
Vocabularies	**n**	**v**	**a**	**ad**	**Sentences**
Atmosphere 大氣圈	√				
Arabian Peninsula 阿拉伯半島	√				
Middle East 中東	√				
Aral Sea 鹹海	√				
Lake Eyre Basin 埃爾湖盆地	√				

Module 9 Taming the sand: A long-last combat against desertification and sandstorms

Unit 9.3 How is China affected by desertification?

Vocabularies	n	v	a	ad	Sentences
Which region in china is facing a high risk of desertification?					
landscape 景觀	√				
rugged 崎嶇			√		➢ The relief of northern China is_____, with many highlands.
Hohhot 呼和浩特	√				
Shaanxi 陝西	√				
sparse 稀疏			√		➢ _____ of land resources is one of the _____ factors that cause desertification.
misuse 誤用	√				
physical factors 自然因素	√				
human factors 人文因素	√				
Over-cultivation 過度耕作	√				➢ _____ means grow too many crops on the fields.
field 田	√				
Overgrazing 過度放牧	√				➢ When people rear too much livestock, _____ occurs.
fuel wood 燃料木	√				

How does desertification affect the people of China?					
Vocabularies	**n**	**v**	**a**	**ad**	**Sentences**
Poverty 貧窮	√				➢ Loss of productive land due to desertification can cause _____-and seriously affects the_____- of people. ➢ The frequency and _____of sandstorms or dust storms will increase due to desertification.
Livelihood 生活	√				
Relocation 改變位置/ 遷移	√				
Frequency 頻次	√				
Intensity 密度	√				

Unit 9.4 How do sandstorms affect us?

Why do most sandstorms occur in northern China? What negative impact do sandstorms bring to the people of China?

Vocabularies	n	v	a	ad	Sentences
Continental 大陸的			√		➤ Cold and strong winds move form the_____ interior to northern China. ➤ Sandstorms can reduces visibility. ➤ Sand and dust can also _____and destroy _____such as buildings and roads. ➤ Sand and dust may contain _____ and _____ This may cause diseases to people.
Interior 內部	√				
Visibility 能見度	√				
Bury 埋葬		√			
Structures 結構	√				
Bacteria 細菌	√				
Fungi 真菌	√				
Discomfort 不舒服	√	√			
Breathing 呼吸	√				
Diseases 疾病	√				
Agriculture 農業	√				
organic matter 有機質	√				

Module 9 Taming the sand: A long-last combat against desertification and sandstorms					
Unit 9.4 How do sandstorms affect us?					
Can sandstorms fo us some good? What is the relationship between desertification and the frequent occurrence of sandstorm in China?					
Vocabularies	**n**	**v**	**a**	**ad**	**Sentences**
Minerals 礦物	√				➢ Sand and dust may contain organic matter and _____. When they are brought to the sea, this facilitates the growth of plant _____ and therefore_____ life. ➢ Sandstorms can reduce the occurrence of _____ and lower the _____average temperature. ➢ Sand and dust particles can act as _____ which favours the formation of rain.
Marine 海洋的			√		
Occurrence 出現	√				
Facilitates 促進		√			
Plankton 浮遊生物	√				
Formation 形成	√				
acid rain 酸雨	√				
Average 平均	√	√	√		
Global 全球			√		
Neutralize 中和		√			
Condensation nuclei 凝結核	√				
Loess Plateau 黃土高原	√				

9.5 What can be done to solve the problem of desertification in China?					
Vocabularies	n	v	a	ad	Sentences
measures 措施	√				➢ Promoting _____ can help reduce population pressure.
control 控制	√				
birth control 生育計劃	√				
land use planning 土地利用計劃	√				➢ Wise _____ planning can check the use of marginal from developing into farmland or _____ land.
grazing land 放牧地	√				
afforestaton 植林	√				➢ _____ can help stabilize moving sand.
stabilize 使穩定		√			
windbreak 防風林	√				➢ In north-west China, _____ are used to stabilize sand dunes.
straw checkerboards 草方格					
sand dunes 沙丘	√				➢ The _____ wall is being set up to improve _____ conditions and check desertification in northern China.
Green Great Wall 綠色長城	√				
Three-North Shelterbelt 三北防護林	√				
ecological 生態的			√		➢ By providing more _____ energy, people will not cut trees for fuel wood.
environmentally-friend energy 環保能源	√				
pastureland 牧場	√				➢ _____- can help farmers and nomads earn a living without damaging the environment.
woodland 林地	√				
infrastructure 基建	√				
Green tourism 綠色旅遊	√				
nomads 遊牧者	√				

Module 9 Taming the sand: A long-last combat against desertification and sandstorms					
Unit 9.6 What can we learn form the experience of other countries/regions in the world?					
Vocabularies	**n**	**v**	**a**	**ad**	**Sentences**
What has been done to combat 打擊 the problem of desertification in Australia 澳洲?					
Spreading 擴展		√			➢ Introducing＿＿＿＿＿ ＿＿＿＿＿＿of grass and trees on drylands can restore ＿＿＿＿＿＿-and productivity.
Preventive 預防性			√		
Monitor 監察		√			
Restoration 復原	√				
Conserve 保護		√			
Sustainable 可持續的			√		
native species 原生品種	√				
Biodiversity 生物多樣性	√				
Funds 資金	√				

What has been done to combat the problem of desertification in the Sahel?					
Vocabularies	**n**	**v**	**a**	**ad**	**Sentences**
Training 訓練	√				➢ _____local people to conserve land resources and _____ the type and amount of crops to be grown are methods to combat the problem of desertification in the Sahel.
Herds 牧群	√				
Adjusting 調節		√			
Appropriate 合適			√		
Stone lines(diguettes) 石線	√				
Drought-resistant crops 抗旱作物	√				➢ Local people also grows _____ crops during dry periods.
Fences 柵欄	√				➢ Building_____(diguettes) can control water flow and retain soil moisture.
Retain 保留		√			
Drip-irrigation 滴灌	√				➢ Using _____ can reduce waste of water and prevent the build up of salts in the soil.
Solar cookers 太陽能炊具	√				

What are the major similarities and differences between the strategies adopted by MDCs and LDCs?					
Vocabularies	**n**	**v**	**a**	**ad**	**Sentences**
similarities 相似之處	√				➢ In more developed countries(MDSc), the aim to combat desertification usually relates to restore ＿＿＿＿＿＿＿＿ and biodiversity. ➢ In Less developed countries(LDCs), as lack of capital and ＿＿＿＿＿＿＿＿, they usually rely on ＿＿＿＿＿＿＿＿＿＿.
differences 不同之處	√				
strategies 策略	√				
adopted 採用		√			
More developed countries(MDCs)	√				
Less developed countires(LDCs)	√				
ecosystem 生態系統	√				
foreign aid 外國援助	√				
knowledge 知識	√				
technology 科技	√				
tackles 對付		√			

Module 6 Global shift in manufacturing industry					
Unit 6.1 What is the manufacturing industry?					
Vocabularies	**n**	**v**	**a**	**ad**	**Sentences**
What is industry?					
Manufacturing 製造業	√		√		➢ The four sectors of industry include primary, _____, tertiary and _____industry.
industry 產業	√				
Semi-finished product 半製成品	√				
Primary industry 初級產業	√				
Secondary industry 第二產業	√				➢ _____ (secondary) industry refers to those activities that use _____ to make goods, or process _____products to make more _____goods.
Tertiary industry 第三產業	√				
Quaternary industry 第四產業	√				
Raw materials 原料	√				
Valuable goods 具價值的貨品	√				
timbering 木材業	√				
mining 採礦業	√				
textiles 紡織	√				
Iron and steel 鋼鐵	√				
retailing 零售	√				
Technological research 科技研究	√				
Software development 軟件發展	√				

What is a manufacturing system?					
Vocabularies	**n**	**v**	**a**	**ad**	**Sentences**
inputs 投入	√				➢ Manufacturing system consists of_____, _____-and outputs.
processes 過程	√				
outputs 產出	√				
capital 資本	√				
spinning 紡織	√		√		➢ _____factors can affect industrial location and production modes.
weaving 織布	√	√			
dyeing 染色	√				
sewing 縫紉	√				
garment 衣服	√				
Locational factor 區位因素	√				➢ As fresh milk is _____, the factories must be close to the raw material to do the processing work.
Production mode 生產模式	√				
Perishable 易腐的			√		
Processing 加工	√				
occupy 佔據		√			

Module 6 Global shift in manufacturing industry					
Unit 6.2 Where have out factories gone?					
Vocabularies	**n**	**v**	**a**	**ad**	**Sentences**
light industry 輕工業	√				➢ In 1950s, many _____ from the mainland of China provided skills, capital and labour to Hong Kong.
Wig making 假髮製造	√				
Migrants 移民	√				
free port 自由港	√				
Finished products 製成品	√				➢ Hong Kong has a good harbour and a _____policy which allow the easy and free import of raw materials and export of finished products.
Electronics 電子	√				
sharp increase 急劇增長	√				
Wages 工資	√				➢ In mid-1970s, there was a_____increase in _____and rents. Thus, some factories moved from the main urban areas to the _____.
Rents 租金	√				
Suburbs 近郊	√				
Distribution 分佈	√				
Labour-intensive 勞工密集	√				

Vocabularies	n	v	a	ad	Sentences
Zhujiang Delta Region 珠江三角洲	√				➢ From 1980s to early 2000s, most manufacturing industries moved to the
push factor 推因素	√				
pull factor 拉因素	√				_____ _ in Guangdong while the head offices still remained in Hong Kong.
open policy 開放政策	√				
Incentive 誘因	√		√		
High value-added 高增值			√		➢ From early 2000s onwards, some
Automation 自動化	√				
Technology-intensive 科技密集			√		_____ industries have even moved to other Asian countries.
Attractive 吸引			√		
Cyberport 數碼港	√				

How has the production mode in Hong Kong changed?					
Vocabularies	**n**	**v**	**a**	**ad**	**Sentences**
Single-point production 單邊區位生產	√				➢ When all production processes of a product were carried out in the same place, this is called _____ production.
Multi-point production 多邊區位生產	√				
Industrial relocation 工業區位轉移	√				
Administration 行政	√				
Marketing 銷售	√				➢ When the production processes are carried out in different areas, this is known as_____ production.
head-office 總部	√				

Module 6 Global shift in manufacturing industry

Unit 6.3 Does the shift in manufacturing activity occur in other places?

Vocabularies	n	v	a	ad	Sentences
What is the general pattern of the global shift in manufacturing activity?					
Great Lakes Region 大湖區	√				➢ In USA, many industries flourish in the_____ Region, such as iron and steel industry at _____and car-making industry at _____
Coal and iron ore 煤及鐵礦	√				
Flat land 平地	√				
Pittsburgh 匹茲堡	√				
Detroit 底特律	√				
Car making industry 汽車製造業	√				➢ In recent years, many manufacturing activities have shifted from USA to less developed countries like Mexico and China
Mexico 墨西哥	√				
Decade 十	√				
Shifted 遷移		√			➢ When a company sets up production plants in different countries, we called this type of firm a _____ _____(TNC)
Transnational corporation(TNC) 跨國企業	√				
Home country 本國	√				
Distributor 分銷商	√				

What are the factors causing the global shift in manufacturing activity?					
Vocabularies	**n**	**v**	**a**	**ad**	**Sentences**
benefits 利益	√				Attraction of LDCs, such as
special economic zone 經濟特區	√				➢ Incentives are provided in the
maquiladora 加工出口區	√				_____ zones in China and
living standards 生活水準	√				_____ in Mexico.
automobile 汽車	√				➢ With improved
Duty-free 免稅	√				_____,
facilitating 促進		√			some LDCs have become new markets for many
advancements 進步					goods.
location ties 區位連繫	√				
Information and communications technology(ITC)資訊科技	√				Facilitating factors: ➢ The
manage 管理		√			_____ in transport can lower the transport time and costs of goods.
economies of scale 規模經濟效益	√				
access 接觸		√			➢ Advancements in
bargaining 議價			√		_____
widespread 分佈廣的			√		and_____ technology(ICT) allow a
Overseas branches 海外分支公司	√				firm to manage its _____ more easily.

Module 6 Global shift in manufacturing industry					
Unit 6.3 Does the shift in manufacturing activity occur in other places?					
Vocabularies	**n**	**v**	**a**	**ad**	**Sentences**
Where are the major industrial regions in the world? What are their roles?					
division of labour 分工	√				➢ When high-skilled jobs are mainly found in MDCs, while low skilled jobs such processing and _____ are mainly found in the LDCs, _____ on a global scale is formed. In other words, _____ in production occurs. ➢
Globalisation 全球化	√				
High-skilled job 高技術工作	√				
Assembly 裝配	√				
Interdependency 互相依賴	√				

Unit 6.4 What are the pros 優點 and cons 缺點 of the global shift in manufacturing activity?					
Vocabularies	**n**	**v**	**a**	**ad**	**Sentences**
Home countries 祖國	√				Pros:
Host countries 主人國	√				➢ The _____ countries are the countries with the factories move in while the _____ countries where the factories move out.
shareholder 股東	√				
competitive 具競爭力			√		
technical skills 技術	√				➢ In home country, as the production costs are lowered, it makes the products more _____ in the world market.
Social unrest 社會動亂	√				
unemployed 失業		√			
Social problems 社會問題	√				➢ At host country, as new industries set up, this helps improve the _____-of local people.

Vocabularies	n	v	a	ad	Sentences
Urban decay 城市衰落	√				Cons:
economic decline 經濟衰退	√				➢ In home country, workers who cannot change to high-value production or services will become _____
Hinder 阻礙		√			
Production cost 生產成本	√				➢ Unemployment often leads to social _____ and other social problems such as _____and _____ abuse.
drug abuse 濫藥	√				
alcohol abuse 酒精濫用	√				➢ As the local government get less tax, _____- and economic _____occur. ➢ In host country, there are pollution problems. This will _____ its further economic development.

Module 6 Global shift in manufacturing industry					
Unit 6.5 Can industrial development be more sustainable 可持續的?					
Vocabularies	**n**	**v**	**a**	**ad**	**Sentences**
balance 平衡	✓	✓			➢ Sustainable industrial development tries to strike a balance between _____ development, _____ and environmental _____-
strike 追求		✓			
Sustainable development 可持續發展	✓				
Economic development 經濟發展	✓				
Social equity 社會公平	✓				
Environmental conservation 環境保護	✓				
latest 最新	✓		✓	✓	
invest 投資		✓			
install 安裝			✓		
Equipment 儀器	✓				
Approaches 方法	✓	✓			
aerospace industry 航空航太工業	✓				

Vocabularies	n	v	a	ad	Sentences
Universities 大學	√				➢ In United Kingdom, there are different measures to achieve sustainable industrial development, for example, develop new _____for high-tech and high value-added industries; develop _____indu stries such as the wind power industry; attract_____ _to develop science parks and provide_____ __ community development funds to the affected areas.
Efficiency 效率	√				
Regional 地區的	√		√		
green industries 綠色工業	√				
Clusters 集結	√				
wind farm 風力發電場	√				
Expenditures 開支	√				
Ireland 愛爾蘭	√				
Talent 有材華的人	√				

END

Computer Literacy

<u>Glossary</u>

English	中文
analog signal	模擬信號
animation	動畫
backup	備份
bit	二進制位
byte	二進位組，字節
compress	壓縮
convert	轉換
data source	資料來源
digital cameras	數碼相機
digital signal	數碼信號
digitization	數碼化
distortion	失真
encoder	編碼器
frame	畫格
frame rate	畫格速率
guided motion	路徑移動動畫
hard disk drive	硬碟機
intensity	強度
keyframe	關鍵畫格
layer	圖層
light-sensitive	光敏
mail merge	合併列印
memory	記憶體
mono	單聲道
motion tweening	移動補間動畫

English	中文
multimedia application	多媒體應用
noise	噪音
optical disk	光碟
optical zoom	光學變焦
precision	精確度
sample	樣本
sample resolution	取樣解析度
sampling rate	取樣頻率
secondary storage	輔助儲存
sector	磁區
shape tweening	形狀補間動畫
stereo	立體聲
storage capacity	儲存容量
structure	結構
track	磁軌
translation	轉換
vector graphics	向量圖
virus	病毒

Notes

Notes

Notes