

Silver Level

Model Answers 9

Level	IGCSE
Subject	Maths
Exam Board	Edexcel
Difficulty Level	Gold
Booklet	Model Answers 9

Time Allowed: 57 minutes

Score: / 47

Percentage: /100

1 Find the Lowest Common Multiple (LCM) of 20 and 24

Prime Factors of 20: $2 \times 2 \times 5$

Prime Factors of 24: $2 \times 2 \times 2 \times 3$

Distinct prime factors are 2, 2, 2, 3, 5

Lowest common multiple is the distinct prime factor multiplied together

$$2 \times 2 \times 2 \times 3 \times 5 = 120$$

120

.....
(Total for Question is 2 marks)

2

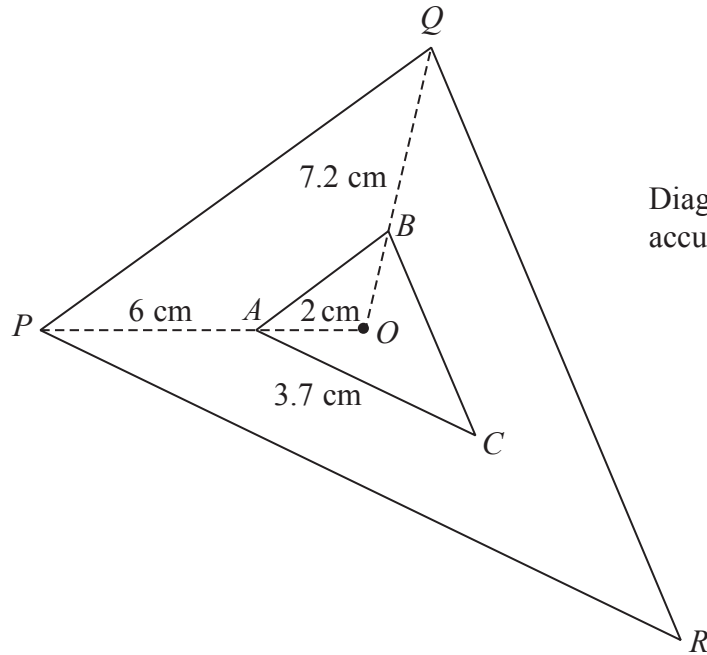


Diagram **NOT** accurately drawn

Triangle PQR is an enlargement, centre O , of triangle ABC .

OAP and OBQ are straight lines.

$OA = 2$ cm.

$AP = 6$ cm.

$BQ = 7.2$ cm.

$AC = 3.7$ cm.

(a) Work out the length of OB .

$$\text{Ratio of sides } AO/AP = BO/BQ$$

$$2/6 = BO / 7.2$$

$$7.2 \times 2/6 = 2.4$$

..... 2.4 cm
(2)

(b) Work out the length of PR .

$$OAP = OA + AP = 8$$

$$\text{Scale factor} = \text{large/small} = 8/2$$

Therefore scale factor is 4

..... 14.8 cm
(3)

$$PR = AC \times \text{sf} = 3.7 \times 4 = 14.8$$

The area of triangle PQR is 72 cm^2

(c) Work out the area of triangle ABC .

Area scale factor is length scale factor squared

$$4^2 = 16$$

Large triangle area = small triangle area \times sf area

$$72/16 = \text{small triangle area} = 4.5$$

$$\begin{array}{r} 4.5 \\ \hline \end{array} \text{ cm}^2$$

(2)

(Total for Question is 7 marks)

3 (a) Solve the simultaneous equations $3x + 5y = 14$ (1)
 $4x + 3y = 4$ (2)

Show clear algebraic working.

$$\textcircled{1} \times 3$$

$$9x + 15y = 42$$

$$\text{Eq 2} \times 5$$

$$20x + 15y = 20$$

$$\text{Eq 2} - 1$$

$$20x - 9x + 15y - 15y = 20 - 42$$

$$11x = -22$$

$$x = -2, \text{ sub back into eq 1}$$

$$-6 + 5y = 14$$

$$5y = 20$$

$$y = 4$$

$$x = -2$$

$$y = 4$$

(4)

(b) Write down the coordinates of the point of intersection of the two lines whose equations are $3x + 5y = 14$ and $4x + 3y = 4$

$$\left(-2, 4 \right)$$

(1)

(Total for Question is 5 marks)

4

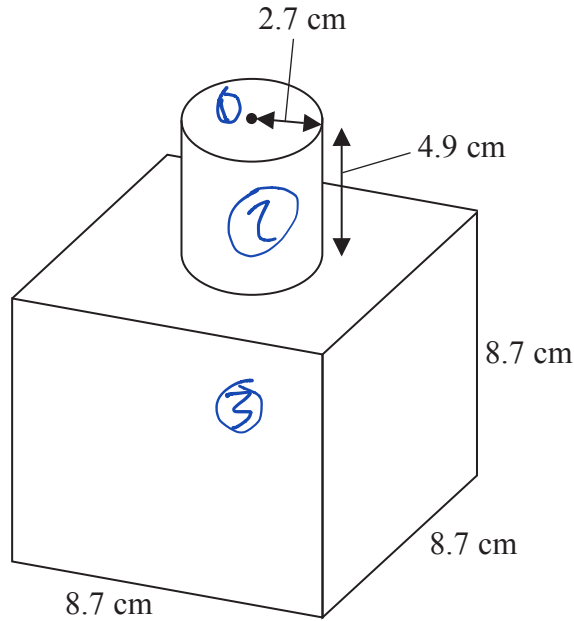


Diagram **NOT** accurately drawn

The diagram shows a shape made from a solid cube and a solid cylinder.
 The cube has sides of length 8.7 cm.
 The cylinder has a radius of 2.7 cm and a height of 4.9 cm.

Calculate the total surface area of the solid shape.
 Give your answer correct to 3 significant figures.

Surface area of 1 can be neglected as it is the same as the surface area missing from 3

Surface area of 2
 $(2\pi r)h = 2\pi(2.7)(4.9)$

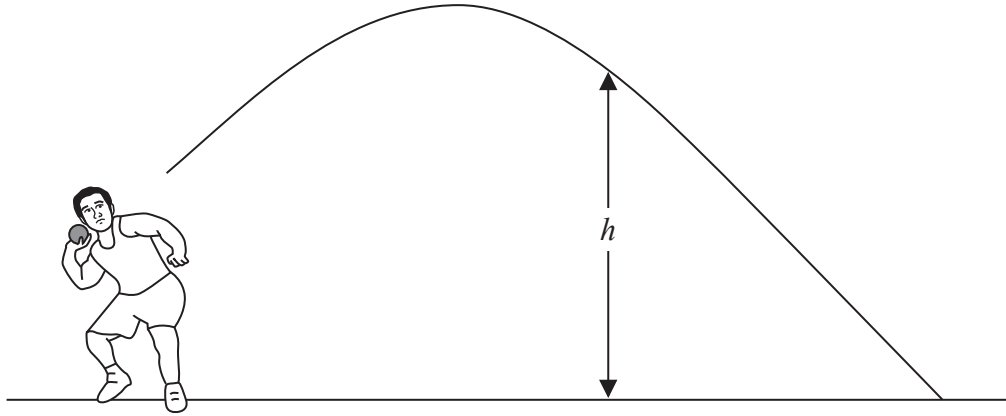
Surface area of 3
 $6 \times \text{each square face} = 6 \times 8.7^2$

Area 2 + 3 = 537

..... 537 cm²

(Total for Question is 3 marks)

5



Ivan is a shot putter.

The formula $h = 2 + 6t - 5t^2$ gives the height, h metres, of the shot above the ground t seconds after he has released the shot.

- (i) Solve $2 + 6t - 5t^2 = 0$
Give your solutions correct to 3 significant figures.
Show your working clearly.

Using the quadratic formula

$$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \rightarrow \frac{-6 \pm \sqrt{6^2 - 4(-5)(2)}}{2(-5)}$$

$$\frac{-6 \pm \sqrt{36 + 40}}{-10}$$

$$\frac{-6 \pm \sqrt{76}}{10} \rightarrow -0.272, 1.47$$

The shot hits the ground after T seconds.

$$\underline{\underline{-0.272, 1.47}}$$

- (ii) Write down the value of T .
Give your answer correct to 3 significant figures.

1.47 is the only positive solution

$$T = \underline{\underline{1.47}}$$

(Total for Question is 4 marks)

- 6 Express 825 as a product of its prime factors.

2 goes into 825 zero times

$$3 \times 275 = 825$$

$$3 \times 5 \times 55 = 825$$

$$3 \times 5 \times 5 \times 11 = 825$$

11 is prime so factors are :

$$3 \times 5 \times 5 \times 11$$

3x5x5x11

(Total for Question is 3 marks)

- 7 The mean of four numbers is 2.6
One of the four numbers is 5

Find the mean of the other three numbers.

For number so sum of all numbers if mean \times number of numbers

$$2.6 \times 4 = 10.4$$

Subtract 4th value from total and divide by 3, the number of values left

$$(10.4 - 5) / 3 = 1.8$$

1.8

(Total for Question is 3 marks)

8 The table shows the land areas, in km², of four countries.

Country	Land area (km ²)
Ethiopia	1.13 × 10 ⁶
Algeria	2.38 × 10 ⁶
Nigeria	9.24 × 10 ⁵
Kenya	5.83 × 10 ⁵

(a) Which country has the largest land area?

Algeria has the largest exponent and coefficient

Algeria

(1)

(b) Calculate the total land area, in km², of all four countries.

Give your answer in standard form.

Ensure numbers have the same exponent then add coefficients.

$$(11.3 + 23.8 + 9.24 + 5.83) \times 10^5$$

$$5.017 \times 10^6$$

$$5.017 \times 10^6 \text{ km}^2$$

(2)

Population density is calculated by the formula

$$\text{Population density} = \text{Population} \div \text{Land area}$$

(c) In one year, the population of Ethiopia was 7.91×10^7

Calculate the population density of Ethiopia for that year.

$$\text{Population density} = \frac{7.91 \times 10^7}{1.13 \times 10^6}$$

Subtract exponents, and divide coefficients

$$\frac{7.91}{1.13} \times 10^{7-6} = 7 \times 10^1 = 70$$

$$70 \text{ people / km}^2$$

(2)

(Total for Question is 5 marks)

9

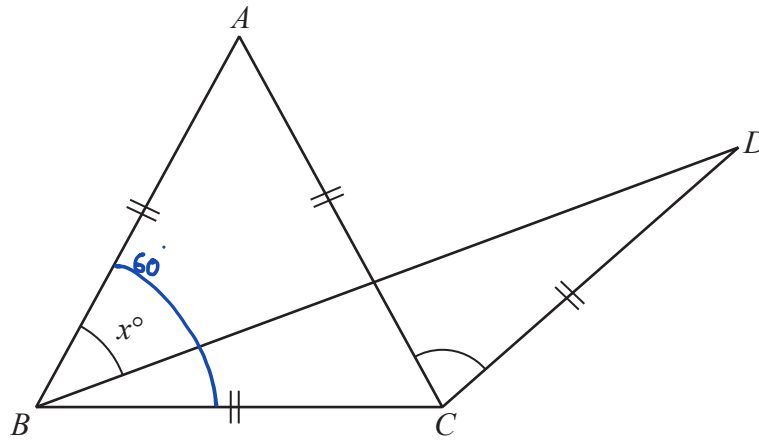


Diagram NOT accurately drawn

The diagram shows an equilateral triangle ABC and an isosceles triangle BCD .
 $AB = AC = BC = CD$.
 Angle $ABD = x^\circ$

Express the size of angle ACD in terms of x° , giving your answer as simply as possible.
 Give a reason for each step in your working.

ABC . Is 60 as it is an equilateral triangle
 $DBC + x$ therefore $= 60$
 $DBC = 60 - x$

$DBC = CDB$ as it is isosceles
 $DBC + CDB + BCD = 180$
 $180 = 60 - x + 60 - x + BCD$
 $60 + 2x = BCD$

$60 + 2x^\circ$

(Total for Question is 4 marks)

10 Factorise fully $4(x - 5)^2 + 3(x - 5)$

Take out a factor of $X-5$

$$(x-5)(4(x-5)+3)$$

$$(x-5)(4x-20+3)$$

$$(x-5)(4x-17)$$

$(x-5)(4x-17)$

(Total for Question is 2 marks)

11 On a map, 4 centimetres represents a real distance of 1 kilometre.

- (a) On the map, the distance between two points is 14 cm.
Work out the real distance between these two points.
Give your answer in kilometres.

$$\begin{aligned}4\text{cm} &= 1000\text{ m therefore } 1\text{ cm} = 250\text{m} \\14\text{cm} \times \text{scale} &= \text{real distance} \\14 \times 250 &= 3500\text{m} = 3.5\text{ km}\end{aligned}$$

3.5 km
(2)

- (b) Work out the scale of the map in the form 1 : n

$$\begin{aligned}\text{Cont. for part a)} \\1\text{m} &= 100\text{ cm} \\250\text{m} &= 25000\text{cm} \\1\text{cm on map} &= 25000\text{ cm in real life so scale is} \\1:25000\end{aligned}$$

1 : 25000
(2)

(Total for Question is 4 marks)

12

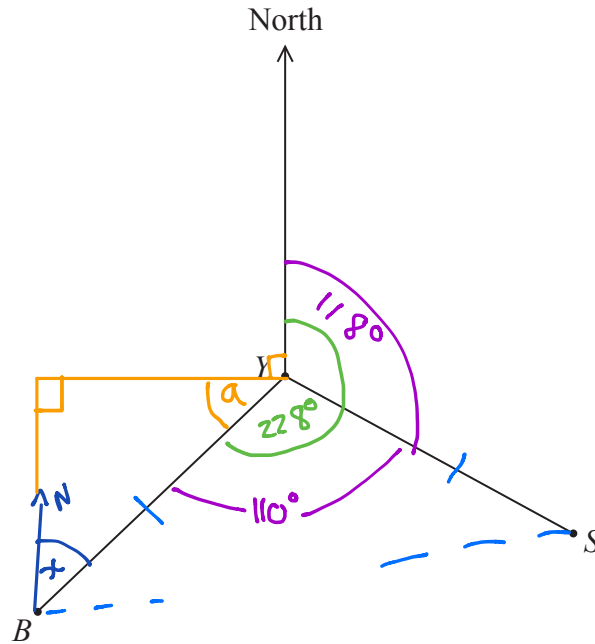


Diagram **NOT** accurately drawn

The diagram shows the positions of a yacht Y , a ship S and a beacon B .
The bearing of B from Y is 228°

(a) Find the bearing of Y from B .

$$90 + 228 + a = 360$$

$$a = 42$$

Angles in a triangle add to 180

$$180 = 90 + 42 + x$$

$$x = 48$$

48 °

(2)

The bearing of S from Y is 118°

(b) Find the size of the angle BYS .

$$BYS = 228 - 118 = 110$$

110 °

(1)

(c) Given also that $BY = SY$, find the bearing of S from B .

$$YBS = YSB \text{ (isosceles triangle)}$$

$$2 YBS + 110 = 180$$

$$2YBS = 70$$

$$YBS = 35$$

$$YBS + x = \text{bearing of } S \text{ from } B = 42 + 35 = 83$$

83

(2)

(Total for Question is 5 marks)