

GRADE 9 ACCELERATED 2014

Exam Revision 2

Paper 2 Type questions

(taken from 0580/s11/41&42)

(a) Work out the following.

(i) $\frac{1}{0.2^2}$

Answer(a)(i) [1]

(ii) $\sqrt{5.1^2 + 4 \times 7.3^2}$

Answer(a)(ii) [1]

(iii) $25^{\frac{1}{2}} \times 1000^{-\frac{2}{3}}$

Answer(a)(iii) [2]

(b) Mia invests \$7500 at 3.5% per year **simple** interest.
Calculate the total amount she has after 5 years.

Answer(b) \$ [3]

(c) Written as the product of prime factors $48 = 2^4 \times 3$.

(i) Write 60 as the product of prime factors.

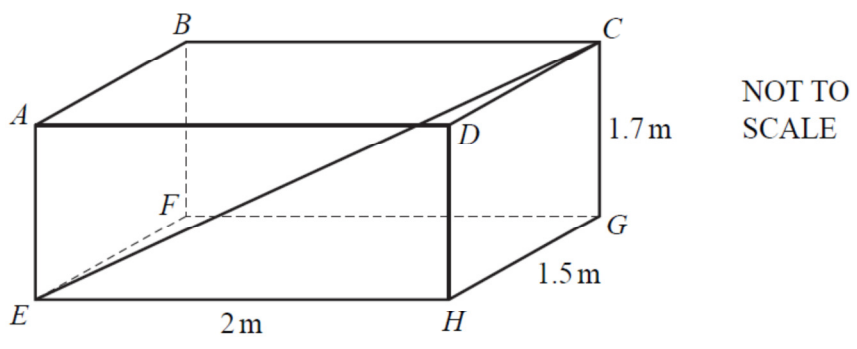
Answer(c)(i) [2]

(ii) Work out the highest common factor (HCF) of 48 and 60.

Answer(c)(ii) [2]

(iii) Work out the lowest common multiple (LCM) of 48 and 60.

Answer(c)(iii) [2]



The diagram shows a box $ABCDEFGH$ in the shape of a cuboid measuring 2 m by 1.5 m by 1.7 m.

(a) Calculate the length of the diagonal EC .

Answer(a) $EC = \dots\dots\dots$ m [4]

(b) Calculate the angle between EC and the base $EFGH$.

Answer(b) $\dots\dots\dots$ [3]

(c) (i) A rod has length 2.9 m, correct to 1 decimal place.

What is the upper bound for the length of the rod?

Answer(c)(i) $\dots\dots\dots$ m [1]

(ii) Will the rod fit completely in the box?

Give a reason for your answer.

Answer(c)(ii) $\dots\dots\dots$ [1]

A school has a sponsored swim in summer and a sponsored walk in winter.
 In 2010, the school raised a total of \$1380.
 The ratio of the money raised in summer : winter = 62 : 53.

- (a) (i) Show clearly that \$744 was raised by the swim in **summer**.

Answer (a)(i)

[1]

- (ii) Alesha's swim raised \$54.10. Write this as a percentage of \$744.

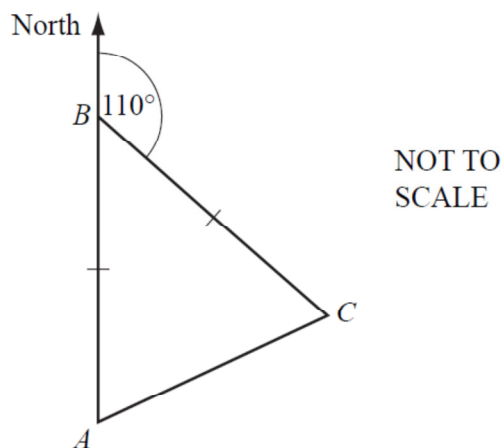
Answer(a)(ii) %[1]

- (iii) Bryan's swim raised \$31.50.
 He received 75 cents for each length of the pool which he swam.

Calculate the number of lengths Bryan swam.

Answer(a)(iii) [2]

- (b) The route for the **sponsored walk in winter** is triangular.

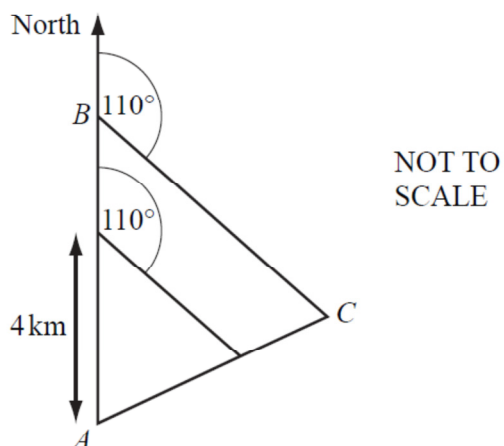


- (i) Senior students start at A , walk North to B , then walk on a bearing 110° to C .
 They then return to A .
 $AB = BC$.

Calculate the bearing of A from C .

Answer(b)(i) [3]

(ii)



$AB = BC = 6$ km.

Junior students follow a **similar** path but they only walk 4 km North from A , then 4 km on a bearing 110° before returning to A .

Senior students walk a total of 18.9 km.

Calculate the distance walked by junior students.

Answer(b)(ii) km [3]

(c) The total amount, \$1380, raised in 2010 was 8% **less** than the total amount raised in 2009.

Calculate the total amount raised in 2009.

Answer(c) \$ [3]

(a) p varies **inversely** as $(m + 1)$.

When $p = 4$, $m = 8$.

Find the value of p when $m = 11$.

Answer(a) $p =$ [3]

(b) (i) Factorise $x^2 - 25$.

Answer(b)(i) [1]

(ii) Simplify $\frac{2x^2 + 11x + 5}{x^2 - 25}$.

Answer(b)(ii) [3]

(c) Solve the inequality $5(x - 4) < 3(12 - x)$.

Answer(c) [3]

(a) Solve $9 < 3n + 6 \leq 21$ for integer values of n .

Answer(a) [3]

(b) Factorise completely.

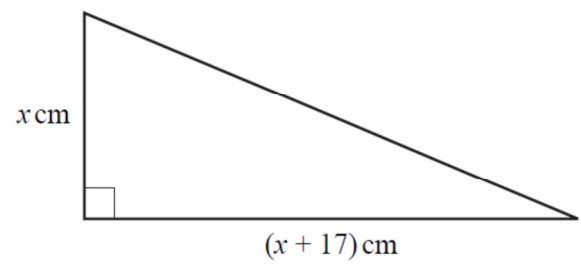
(i) $2x^2 + 10xy$

Answer(b)(i) [2]

(ii) $3a^2 - 12b^2$

Answer(b)(ii) [3]

(c)



NOT TO SCALE

The area of this triangle is 84 cm^2 .

(i) Show that $x^2 + 17x - 168 = 0$.

Answer (c)(i)

[2]

(ii) Factorise $x^2 + 17x - 168$.

Answer(c)(ii) [2]

(iii) Solve $x^2 + 17x - 168 = 0$.

Answer(c)(iii) $x =$ or $x =$ [1]

(d) Solve

$$\frac{15-x}{2} = 3 - 2x.$$

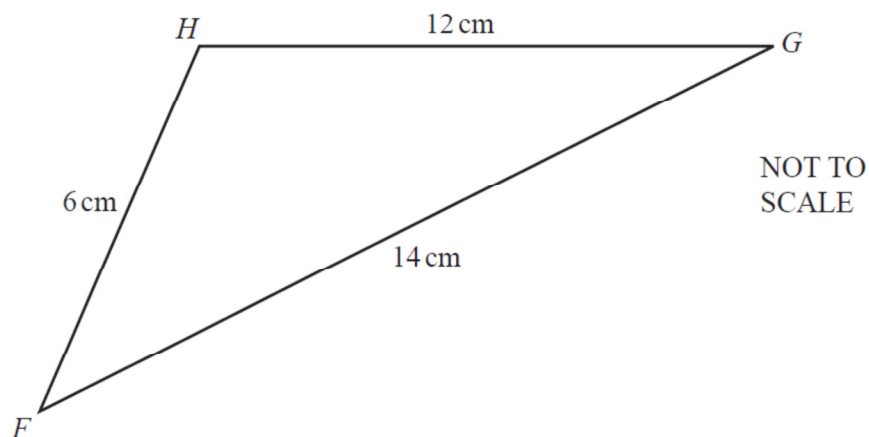
Answer(d) $x =$ [3]

(e) Solve $2x^2 - 5x - 6 = 0$.

Show all your working and give your answers correct to 2 decimal places.

Answer(e) $x =$ or $x =$ [4]

(a)



The diagram shows triangle FGH , with $FG = 14$ cm, $GH = 12$ cm and $FH = 6$ cm.

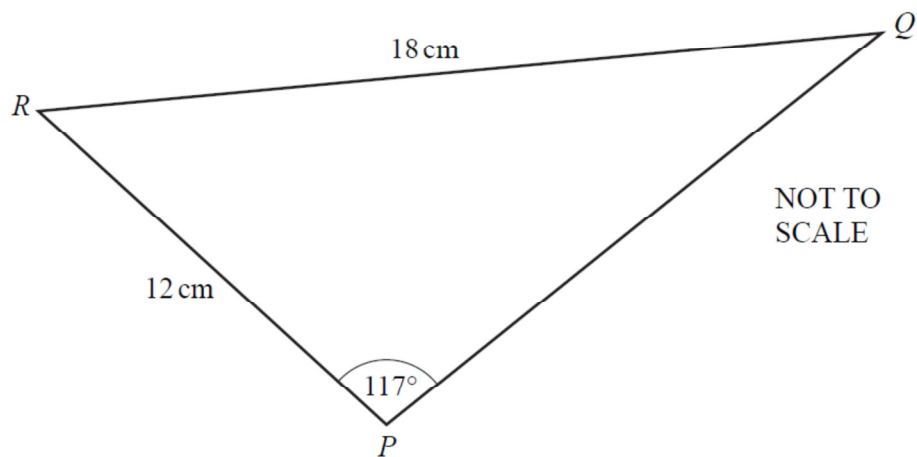
(i) Calculate the size of angle HFG .

Answer(a)(i) Angle $HFG =$ [4]

(ii) Calculate the area of triangle FGH .

Answer(a)(ii) cm^2 [2]

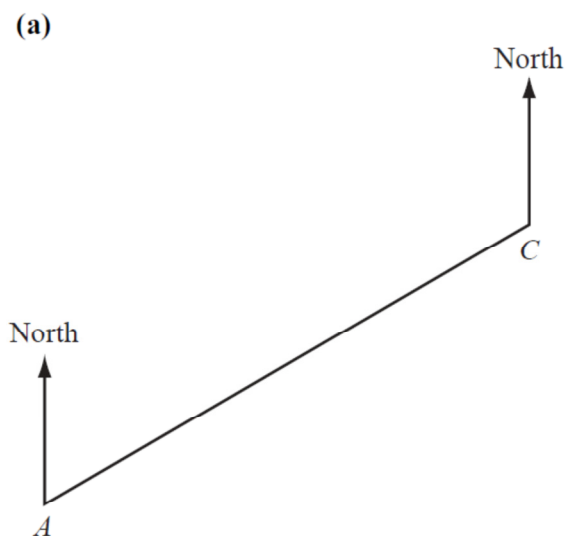
(b)



The diagram shows triangle PQR , with $RP = 12\text{ cm}$, $RQ = 18\text{ cm}$ and angle $RPQ = 117^\circ$.

Calculate the size of angle RQP .

Answer(b) Angle $RQP = \dots\dots\dots$ [3]



The scale drawing shows the positions of two towns A and C on a map.
On the map, 1 centimetre represents 20 kilometres.

- (i) Find the distance in kilometres from town A to town C .

Answer(a)(i) km [2]

- (ii) Measure and write down the bearing of town C from town A .

Answer(a)(ii) [1]

- (iii) Town B is 140 km from town C on a bearing of 150° .

Mark accurately the position of town B on the scale drawing. [2]

- (iv) Find the bearing of town C from town B .

Answer(a)(iv) [1]

- (v) A lake on the map has an area of 0.15 cm^2 .

Work out the actual area of the lake.

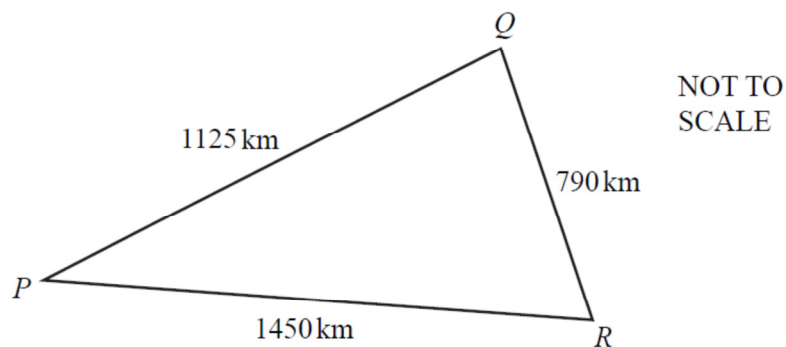
Answer(a)(v) km^2 [2]

- (b) A plane leaves town C at 11 57 and flies 1500 km to another town, landing at 14 12.

Calculate the average speed of the plane.

Answer(b) km/h [3]

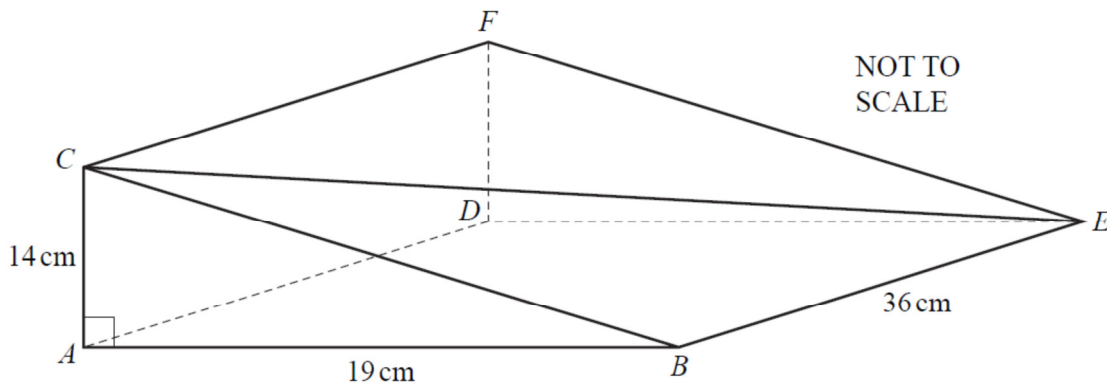
- (c)



The diagram shows the distances between three towns P , Q and R .

Calculate angle PQR .

Answer(c) Angle $PQR =$ [4]



In the diagram, $ABCDEF$ is a prism of length 36 cm.
 The cross-section ABC is a right-angled triangle.
 $AB = 19$ cm and $AC = 14$ cm.

Calculate

- (a) the length BC ,

Answer(a) $BC = \dots\dots\dots$ cm [2]

- (b) the total surface area of the prism,

Answer(b) $\dots\dots\dots$ cm² [4]

- (c) the volume of the prism,

Answer(c) $\dots\dots\dots$ cm³ [2]

- (d) the length CE ,

Answer(d) $CE = \dots\dots\dots$ cm [2]

- (e) the angle between the line CE and the base $ABED$.

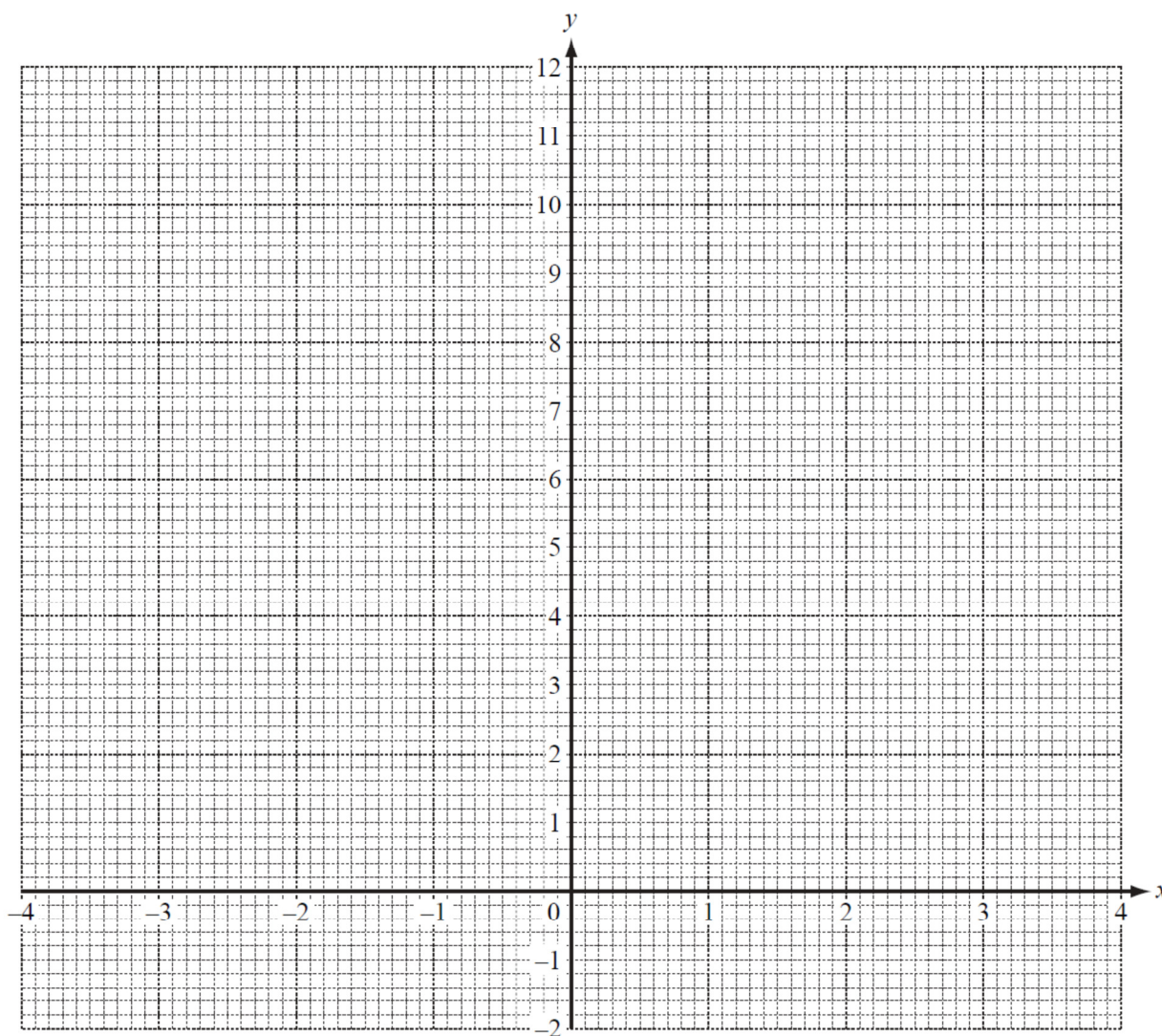
Answer(e) $\dots\dots\dots$ [3]

- 7 (a) Complete the table of values for the equation $y = \frac{4}{x^2}$, $x \neq 0$.

x	-4	-3	-2	-1	-0.6		0.6	1	2	3	4
y	0.25	0.44			11.11			4.00		0.44	

[3]

- (b) On the grid, draw the graph of $y = \frac{4}{x^2}$ for $-4 \leq x \leq -0.6$ and $0.6 \leq x \leq 4$.



[5]

- (c) Use your graph to solve the equation $\frac{4}{x^2} = 6$.

Answer(c) $x = \dots\dots\dots$ or $x = \dots\dots\dots$ [2]

- (d) By drawing a suitable tangent, estimate the gradient of the graph where $x = 1.5$.

Answer(d) $\dots\dots\dots$ [3]

- (e) (i) The equation $\frac{4}{x^2} - x + 2 = 0$ can be solved by finding the intersection of the graph of $y = \frac{4}{x^2}$ and a straight line.

Write down the equation of this straight line.

Answer(e)(i) $\dots\dots\dots$ [1]

- (ii) On the grid, draw the straight line from your answer to **part (e)(i)**. [2]

- (iii) Use your graphs to solve the equation $\frac{4}{x^2} - x + 2 = 0$.

Answer(e)(iii) $x = \dots\dots\dots$ [1]

The first and the n th terms of sequences A , B and C are shown in the table below.

(a) Complete the table for each sequence.

	1st term	2nd term	3rd term	4th term	5th term	n th term
Sequence A	1					n^3
Sequence B	4					$4n$
Sequence C	4					$(n + 1)^2$

[5]

(b) Find

(i) the 8th term of sequence A ,

Answer(b)(i) [1]

(ii) the 12th term of sequence C .

Answer(b)(ii) [1]

(c) (i) Which term in sequence A is equal to 15 625?

Answer(c)(i) [1]

(ii) Which term in sequence C is equal to 10 000?

Answer(c)(ii) [1]

(d) The first four terms of sequences D and E are shown in the table below.

Use the results from **part (a)** to find the 5th and the n th terms of the sequences D and E .

	1st term	2nd term	3rd term	4th term	5th term	n th term
Sequence D	5	16	39	80		
Sequence E	0	1	4	9		

[4]

- (a) (i) Work out the first 3 terms of the sequence whose n th term is $n(n + 2)$.

Answer(a)(i) , , [2]

- (ii) Which term in this sequence is equal to 168?

Answer(a)(ii) [3]

- (b) Find a formula for the n th term of the following sequences.

- (i) 5 8 11 14 17

Answer(b)(i) [2]

- (ii) 1 2 4 8 16

Answer(b)(ii) [2]

- (c)



Diagram 1



Diagram 2

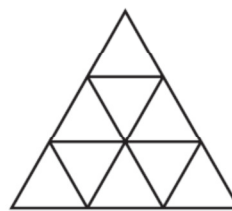


Diagram 3

A sequence of diagrams is formed by drawing equilateral triangles each of side one centimetre.
Diagram 1 has 3 one centimetre lines.
Diagram 2 has 9 one centimetre lines.

The formula for the **total** number of one centimetre lines needed to draw **all of the first n diagrams** is

$$an^3 + bn^2 + n.$$

Find the values of a and b .

Answer(c) $a =$

$b =$ [6]