

# Silver Level

## Model Answers 8

Level	IGCSE
Subject	Maths
Exam Board	Edexcel
Difficulty Level	Gold
Booklet	Model Answers 8

**Time Allowed:** 59 minutes

**Score:** / 49

**Percentage:** /100

1

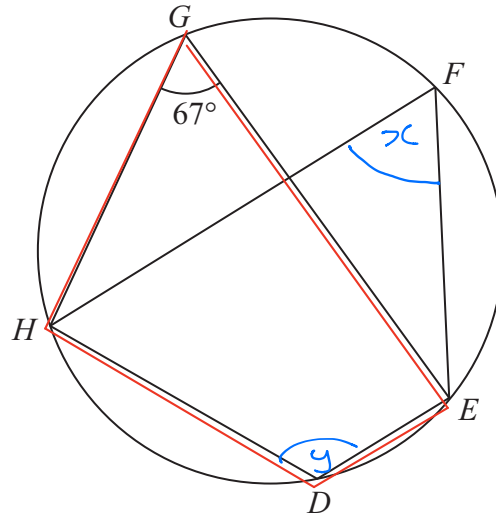


Diagram **NOT** accurately drawn

$D, E, F, G$  and  $H$  are points on a circle.  
Angle  $EGH = 67^\circ$

(a) Find the size of angle  $EFH$ . ( $x$ )

Inscribed angles theorem  $EFH = EGH$

67 °  
.....  
(1)

(b) (i) Find the size of angle  $EDH$ . ( $y$ )

Cyclic quadrilateral  $GHDE$

113 °  
.....

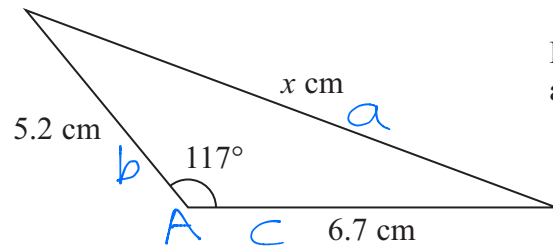
(ii) Give a reason for your answer.

Opposite angles in a cyclic quadrilateral sum to 180 degrees

.....  
(2)

**(Total for Question is 3 marks)**

2

Diagram **NOT**  
accurately drawnCalculate the value of  $x$ .

Give your answer correct to 3 significant figures.

Cosine rule:

$$a^2 = b^2 + c^2 - 2bc \cos A$$

$$\begin{aligned} x^2 &= 6.7^2 + 5.2^2 - 2 \times 6.7 \times 5.2 \times \cos(117) \\ &= 44.89 + 27.04 - 31.63 \\ &= 103.56 \dots \end{aligned}$$

$$x \approx \underline{\underline{10.2}}$$

$$x = \underline{\underline{10.2}}$$

**(Total for Question is 3 marks)**

3 A garage tests cars for faults.

There are three types of fault – braking, steering and lighting.

A car fails the test if it has one or more of these three types of fault.

Last week, 11 cars had braking faults

9 cars had steering faults

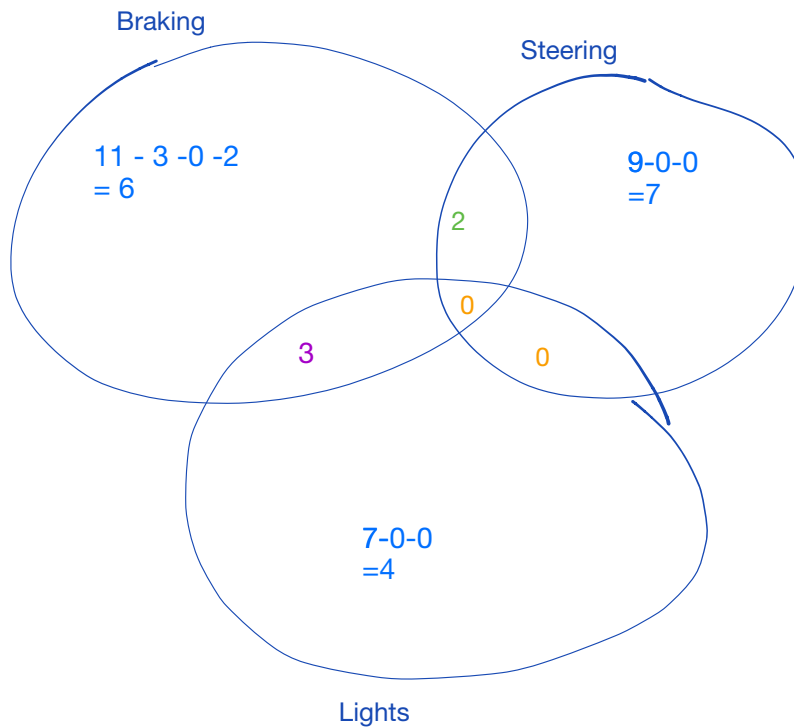
7 cars had lighting faults

no car had both steering faults and lighting faults

2 cars had both braking faults and steering faults

3 cars had both braking faults and lighting faults.

By drawing a Venn Diagram, or otherwise, find the number of cars which failed the test last week.



$$\begin{aligned} \text{Sum of all values} &= \\ 6 + 2 + 7 + 3 + 0 + 0 + 4 &= 22 \end{aligned}$$

4

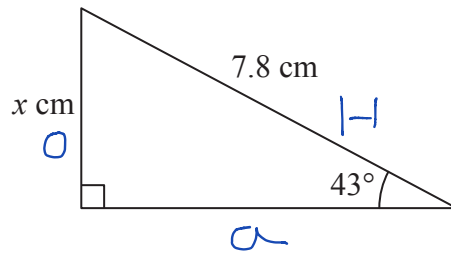


Diagram **NOT**  
accurately drawn

Work out the value of  $x$ .  
Give your answer correct to 3 significant figures.

$$\sin \theta = \frac{\text{O}}{\text{H}} \quad \text{c}^a \quad \text{T}^o$$

O and H so using sin

$$\begin{aligned} \sin(43) &= x/7.8 \\ 7.8 \times \sin(43) &= 5.319 \end{aligned}$$

$$x = \dots\dots\dots 5.32$$

(Total for Question is 3 marks)

5 (a) Write  $2^3 \times 2^4$  as a single power of 2

For multiplication add the powers

$$2^{3+4} = 2^7$$

$$n = \frac{2^7}{\dots}$$

(1)

(b)  $280 = 2^n \times 5 \times 7$

Find the value of  $n$ .

$$\frac{280}{5 \times 7} = 2^n$$

$$8 = 2^n$$

$$\underline{\underline{n=3}}$$

$$\text{as } \underline{\underline{2^3=8}}$$

$$n = \frac{3}{\dots}$$

(2)

(Total for Question is 3 marks)

6

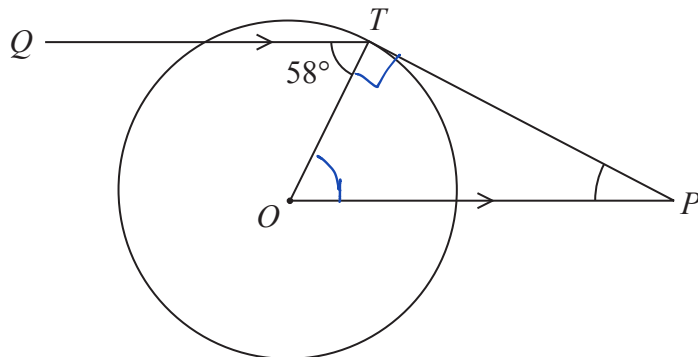


Diagram **NOT** accurately drawn

$T$  is a point on a circle, centre  $O$ .

$Q$  is a point such that angle  $QTO = 58^\circ$

$P$  is the point such that  $OP$  is parallel to  $QT$  and  $PT$  is a tangent to the circle.

Work out the size of angle  $OPT$ .

$OPT$  is 90 degrees as angle between a tangent and a radius is exactly 90

$TOP$  is 58 as  $TOP$  and  $OTQ$  are alternate angles.

Angles In a triangle add to 180

$$X + 58 + 90 = 180$$

$$32 = x$$

7 Solve  $\frac{6x-1}{4} - \frac{5-2x}{2} = 1$

Show clear algebraic working.

Multiply by 4 and 2

$$2(6x-1) - 4(5-2x) = (1)(4)(2)$$

$$12x - 2 - 20 + 8x = 8$$

$$20x - 22 = 8$$

$$20x = 8 + 22 = 30$$

$$x = 3/2 = 1.5$$

$$x = \underline{1.5}$$

(Total for Question is 4 marks)



8

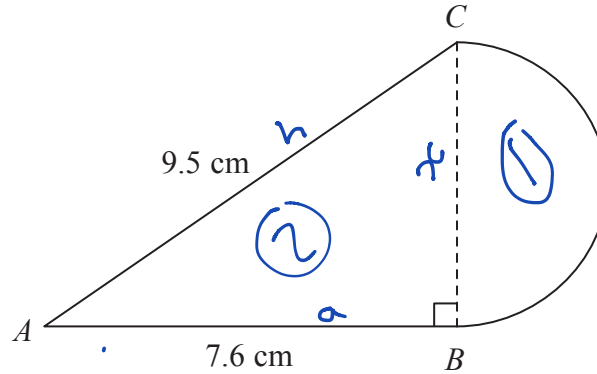


Diagram **NOT**  
accurately drawn

The diagram shows a shape made from triangle  $ABC$  and a semicircle with diameter  $BC$ . Triangle  $ABC$  is right-angled at  $B$ .  $AB = 7.6$  cm and  $AC = 9.5$  cm.

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

$$\begin{aligned} a^2 + x^2 &= h^2 \\ 7.6^2 + x^2 &= (9.5)^2 \\ x^2 &= 9.5^2 - 7.6^2 \\ x &= \sqrt{9.5^2 - 7.6^2} \\ x &= \sqrt{32.49} \\ x &= \underline{\underline{5.7}} \end{aligned}$$

area of 2 :

$$\begin{aligned} &\frac{1}{2}(\text{base})(\text{height}) \\ &\frac{1}{2}(7.6)(5.7) = 21.66 \end{aligned}$$

area of 1 :

Half area of a circle of diameter  $x$

$$\begin{aligned} &\frac{1}{2} \pi \left(\frac{x}{2}\right)^2 \\ &\frac{1}{2} \pi \left(\frac{5.7}{2}\right)^2 = \underline{\underline{12.8}} \end{aligned}$$

$$\text{Area } 1 + 2 = 21.66 + 12.8 = 34.4$$

..... 34.4 ..... cm<sup>2</sup>

(Total for Question is 5 marks)

9

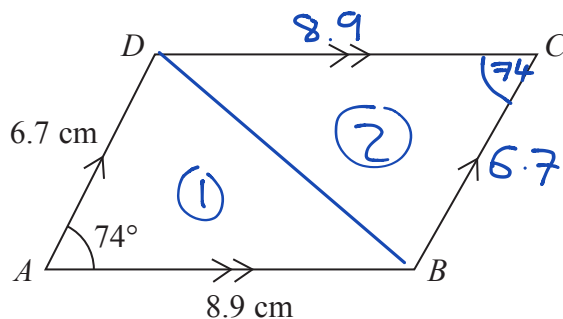


Diagram **NOT**  
accurately drawn

$ABCD$  is a parallelogram.

$AB = 8.9$  cm.

$AD = 6.7$  cm.

Angle  $BAD = 74^\circ$

Calculate the area of parallelogram  $ABCD$ .

Give your answer correct to 3 significant figures.

Area of triangle 1 = area of triangle 2

$$\begin{aligned} \text{Area of 1} &= \frac{1}{2} ab \sin(c) \\ &= \frac{1}{2} (6.7)(8.9) \sin(74) \end{aligned}$$

$$\begin{aligned} \text{Area of 1+2} &= (6.7)(8.9) \sin(74) \\ &= 57.3 \end{aligned}$$

57.3 cm<sup>2</sup>

(Total for Question is 3 marks)

10 Factorise completely  $(12x - y)^2 - (4x - 3y)^2$

$$(12x - y)(12x - y) - (4x - 3y)(4x - 3y)$$

Expand using foil

$$(144x^2 - 12xy - 12xy + y^2) - (16x^2 - 12xy - 12xy + 9y^2)$$

$$144x^2 - \cancel{12xy} - \cancel{12xy} + y^2 - 16x^2 + 12xy + 12xy - 9y^2$$

$$144x^2 - 16x^2 + y^2 - 9y^2$$

$$128x^2 - 8y^2$$

$$8(16x^2 - y^2)$$

Difference of two squares  $\rightarrow 8(4x - y)(4x + y)$

8(4x - y)(4x + y)

(Total for Question is 2 marks)

- 11 (a) Dilip buys a painting for \$ 675  
Later, he sells it and makes a percentage profit of 12%.

Work out the price for which Dilip sells the painting.

Increase by 12% can be written as a multiplication by 1.12

$$675 \times 1.12 = 756$$

\$ 756  
(3)

- (b) Renuka sells her car.  
She makes a loss of \$ 2162  
Her percentage loss is 23%.

Work out the price for which Renuka sells her car.

23% loss is equal to 2162

$$\text{Original value} \times 0.23 = 2162$$

$$\text{Original value} = 2162 / 0.23 = 7238$$

\$ 7238  
(3)

- (c) Lin bought a computer that had a value of \$ 1500  
At the end of each year, the value of her computer had depreciated by 40% of its value at the start of that year.

Calculate the value of her computer at the end of 3 years.

Depreciation by 40 % is the same as a multiple by .60

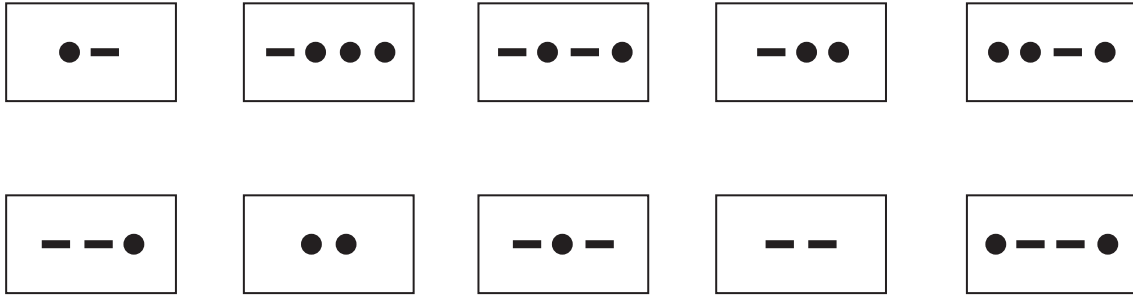
Each year it loses 40%

$$1500 \times 0.6 \times 0.6 \times 0.6 = 324$$

\$ 324  
(3)

(Total for Question is 9 marks)

- 12 Morse Code uses dots (●) and dashes (—) to represent each letter of the alphabet. Here are 10 cards. Each card has the Morse Code for a letter on it.



- (a) Kelly takes at random one of the cards.

Find the probability that she takes a card with 2 dots or a card with 3 dots.

4 cards with two dots, 2 cards with 3 dots

$$6/10 = 3/5$$

3/5

(2)

- (b) Hashim has the 10 cards.

He takes at random a card 200 times.

He replaces the card each time.

Work out an estimate for the number of times he will take a card with exactly 2 dots.

Probability x number of trials = approx estimate

4 cards with two dots

$$\text{Probability} = 4/10, 4/10 * 200 = 80$$

80

(2)

- (c) Shani takes at random two of the 10 cards without replacement.

Calculate the probability that

- (i) there is exactly 1 dot on each card she takes,

3 card with one dot

First time probability is 3/10

Second time as card has not been replaced only 2 cards left with one dot out of the 9, probability is 2/9

$$3/10 \times 2/9 = 6/90$$

6/90

(ii) there is a total of 4 dots on the two cards she takes.

Possible combinations are 1,3 3,1 2,2

Sum the probability of the 3 possible combinations

$$\frac{3}{10} \times \frac{2}{9} + \frac{4}{10} \times \frac{3}{9} + \frac{2}{10} \times \frac{3}{9} = \frac{24}{90}$$

24/90

(5)

**(Total for Question is 9 marks)**