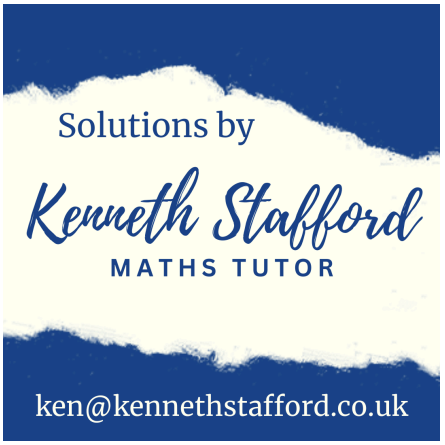
Name: SOLUTIONS

GCSE (1 - 9)

Circles



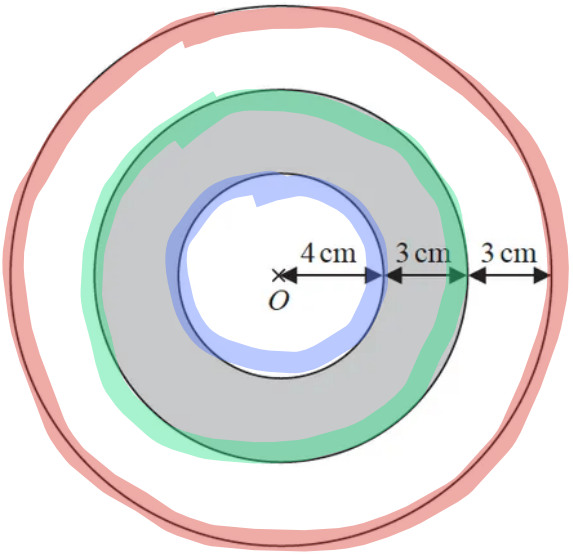


These questions are compiled from *released* Pearson Edexcel GCSE maths exam papers
They contain exam questions from up until the ***Summer 2023*** exam series
More recent exam papers do exist but are withheld for mock exams
As new exam papers are released these worksheets will gradually be updated
The ***most current*** version of these worksheets will always be available at: kennethstafford.co.uk

Question	Where the question appeared
1	Edexcel, GCSE, Autumn 2017, Paper 1F, Q26
2	Edexcel, GCSE, Autumn 2017, Paper 2F, Q18
3	Edexcel, GCSE, Autumn 2018, Paper 1F, Q26
4	Edexcel, GCSE, Autumn 2019, Paper 3F, Q10
5	Edexcel, GCSE, Autumn 2019, Paper 3F, Q30
6	Edexcel, GCSE, Summer 2017, Paper 1F, Q18
7	Edexcel, GCSE, Summer 2018, Paper 1F, Q9
8	Edexcel, GCSE, Summer 2018, Paper 2F, Q19
9	Edexcel, GCSE, Summer 2023, Paper 1F, Q6

1

The diagram shows a logo made from three circles.

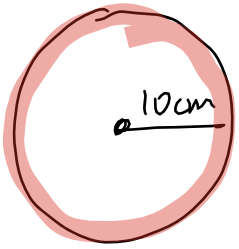


Each circle has centre O.

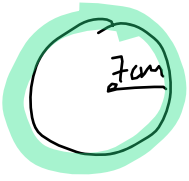
Daisy says that exactly $\frac{1}{3}$ of the logo is shaded.

Is Daisy correct?
You must show all your working.

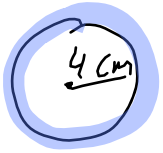
Shaded = $49\pi - 16\pi = 33\pi$



Area = 100π



Area = 49π



Area = 16π

$$\frac{33\pi}{100\pi} = \frac{33}{100}$$

$$= 0.33$$

$$0.33 < \frac{1}{3}$$

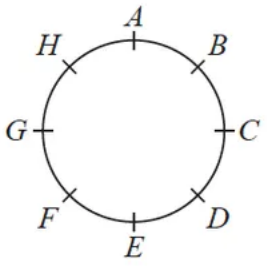
No. Daisy is not correct

(Total for Question 26 is 4 marks)

[Edexcel, GCSE, Summer 2017, Paper 1F, Q26]

2

Hasmeet walks once round a circle with diameter 80 metres.



There are 8 points equally spaced on the circumference of the circle.

(a) Find the distance Hasmeet walks between one point and the next point.

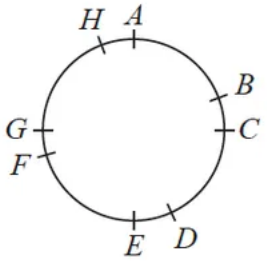
Circumference = $80 \times \pi = 80\pi$

$$\frac{80\pi}{8} = 10\pi$$

10π ..... m

(2)

Four of the points are moved, as shown in the diagram below.



Hasmeet walks once round the circle again.

(b) Has the mean distance that Hasmeet walks between one point and the next point changed? You must give a reason for your answer.

No. The mean distance will remain the same.

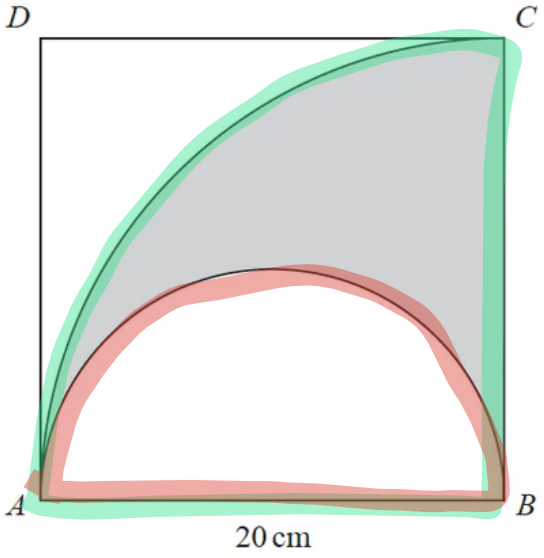
(1)

(Total for Question 18 is 3 marks)

[Edexcel, GCSE, Summer 2017, Paper 2F, Q18]

3

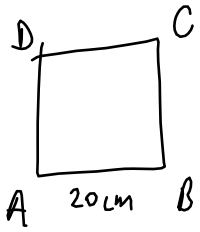
The diagram shows a square $ABCD$ with sides of length 20 cm.
It also shows a semicircle and an arc of a circle.



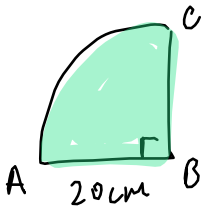
AB is the diameter of the semicircle.
AC is an arc of a circle with centre B.

Show that $\dfrac{\text{area of shaded region}}{\text{area of square}} = \dfrac{\pi}{8}$

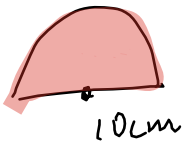
$\dfrac{50\pi}{400} = \dfrac{\pi}{8}$ (÷50 ÷50)



Area $= 20^2 = 400 cm^2$



Area $= \dfrac{\pi \times 20^2}{4} = 100\pi \ cm^2$



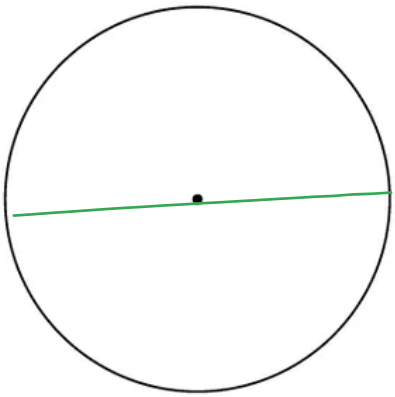
Area $= \dfrac{\pi \times 10^2}{2} = 50\pi$

Shaded Area $= 100\pi - 50\pi = 50\pi$

(Total for Question 26 is 4 marks)

[Edexcel, GCSE, Autumn 2018, Paper 1F, Q26]

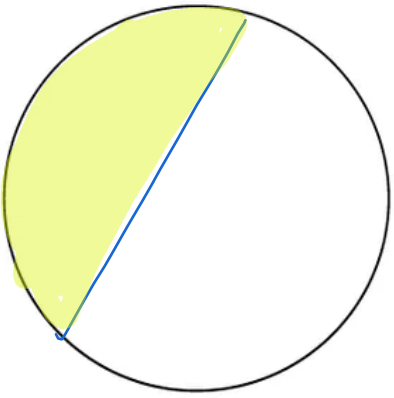
4



(a) On the diagram above, draw a diameter of the circle.

(1)

(b) On the diagram below, draw a segment of the circle.
Shade the segment.



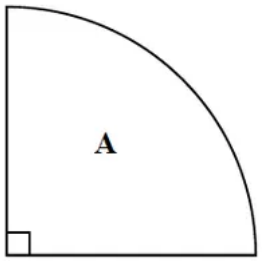
(1)

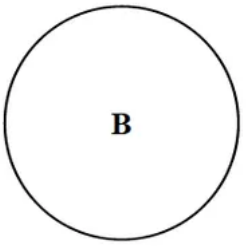
(Total for Question 10 is 2 marks)

[Edexcel, GCSE, Autumn 2019, Paper 3F, Q10]

5

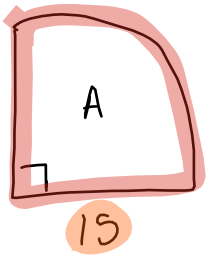
A is in the shape of a quarter circle of radius 15 cm.
B is in the shape of a circle.





The area of **A** is 9 times the area of **B**.

Show that the radius of **B** is 2.5 cm.



Area = $\frac{15^2 \times \pi}{4}$ = $176.71\ cm^2$

Area of circle = $176.71 \div 9 = 19.63\ cm^2$

$\pi r^2 = 19.63$

$r^2 = \frac{19.63}{\pi}$

$r = \sqrt{\frac{19.63}{\pi}} = 2.5\ cm$

(Total for Question 30 is 3 marks)

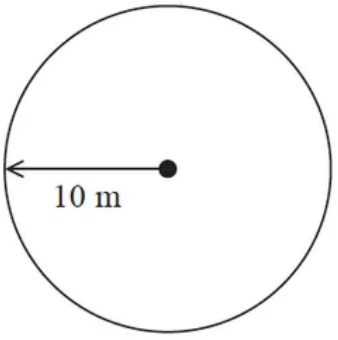
[Edexcel, GCSE, Autumn 2019, Paper 3F, Q30]

6

Balena has a garden in the shape of a circle of radius 10 m.
He is going to cover the garden with grass seed to make a lawn.

Grass seed is sold in boxes.
Each box of grass seed will cover 46 m^2 of garden.

Balena wants to cover all the garden with grass seed.



(a) Work out an estimate for the number of boxes of grass seed Balena needs.
You must show your working.

Area of garden = $\pi \times 10^2 \approx 3 \times 100 = 300 m^2$

$\frac{300}{46} \approx \frac{300}{50} = 6$

So 6 boxes needed

6

(4)

(b) Is your estimate for part (a) an underestimate or an overestimate?
Give a reason for your answer.

Underestimate. Garden is bigger and the boxes cover less than $50 m^2$.

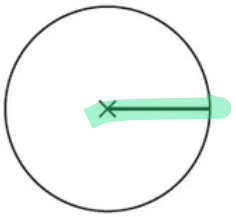
(1)

(Total for Question 18 is 5 marks)

[Edexcel, GCSE, Summer 2017, Paper 1F, Q18]

7

The centre of this circle is marked with a cross (×).

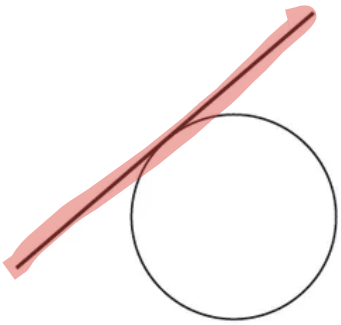


(a) Write down the mathematical name of the straight line shown in the circle.

radius

(1)

(b) Write down the mathematical name of the straight line that is touching the circle.



tangent

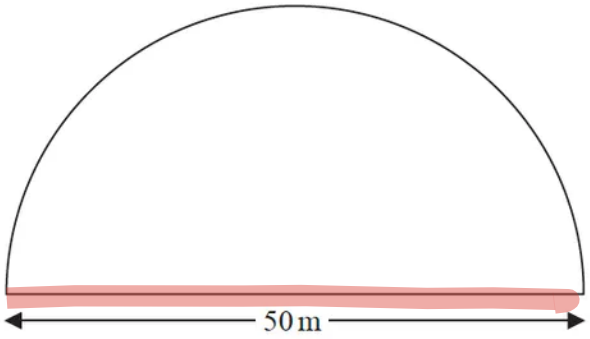
(1)

(Total for Question 9 is 2 marks)

[Edexcel, GCSE, Summer 2018, Paper 1F, Q9]

8

A farmer has a field in the shape of a semicircle of diameter 50 m.

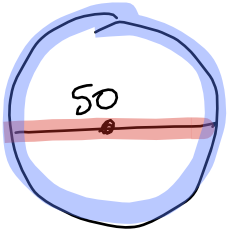


The farmer asks Jim to build a fence around the edge of the field.
Jim tells him how much it will cost.

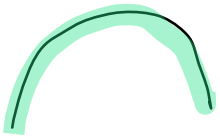
Total cost = £29.86 per metre of fence plus £180 for each day's work

Jim takes three days to build the fence.

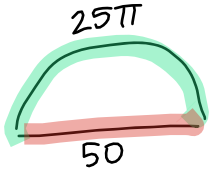
Work out the total cost.



Circumference = $\pi \times 50 = 50\pi$



Arc length = $\frac{50\pi}{2} = 25\pi$



Fence = $25\pi + 50 = 128.5\text{m}$

Cost = $29.86 \times 128.5 + 180 \times 3 = 4378.1988$

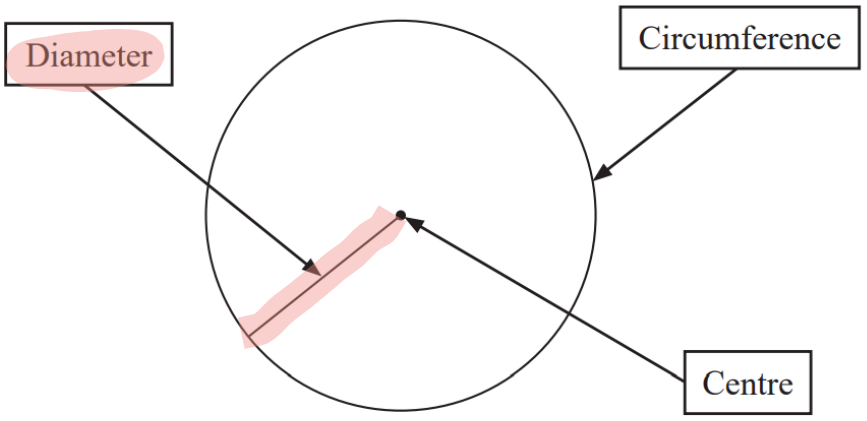
£ 4378.20

(Total for Question 19 is 5 marks)

[Edexcel, GCSE, Summer 2018, Paper 2F, Q19]

9

Freddie adds labels to this diagram of a circle.



Explain why one of the labels is wrong.

The radius has been labelled as the diameter.

(Total for Question 6 is 1 mark)

[Edexcel, GCSE, Summer 2023, Paper 1F, Q6]