Write your name here

Surname	Other Names

Mathematics

June 2017 Paper 3 (Calculator Allowed)
Part 2 (Second half of the paper)
Edexcel Higher Tier

Time: 45 minutes

Q	Topic	Max Mark	My Marks
11	The Product Rule for Counting	2	
12	Ratio Problems	3	
13	Inequalities on Graphs	4	
14	Simplifying Algebraic Fractions, Rearranging Harder Formula	6	
15	The Area of any Triangle	5	
16	Iteration	5	
17	Bounds, Speed	5	
18	Trigonometry (SOHCAHTOA), Arc Length	5	
19	Solving Quadratic Inequalities	3	
20	Exponential Graphs, Equation of a Circle	4	
	Total	42	

11 Jeff is choosing a shrub and a rose tree for his garden.
At the garden centre there are 17 different types of shrubs and some rose trees.

Jeff says,

"There are 215 different ways to choose one shrub and one rose tree."

Could Jeff be correct?
You must show how you get your answer.

(Total for Question 11 is 2 marks)

12 The points A, B, C and D lie in order on a straight line.

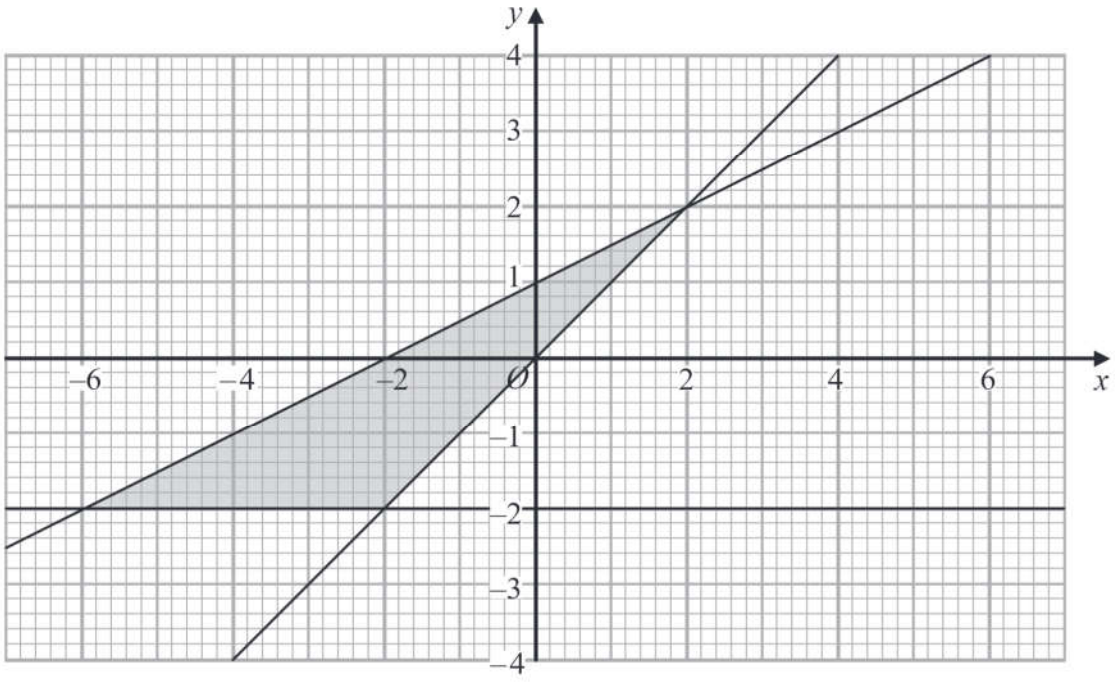
$$AB:BD = 1:5$$
$$AC:CD = 7:11$$

Work out $AB:BC:CD$

..... : ..... : .....

(Total for Question 12 is 3 marks)

13



Write down the three inequalities that define the shaded region.

.....

.....

.....

(Total for Question 13 is 4 marks)

14 (a) Simplify $\dfrac{x^2 - 16}{2x^2 - 5x - 12}$

.....

(3)

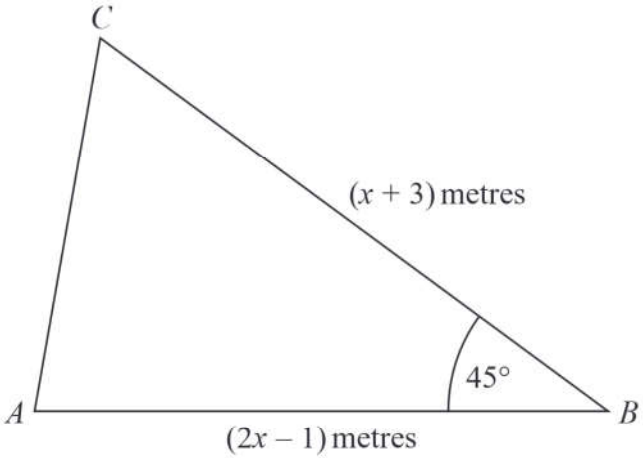
(b) Make v the subject of the formula $w = \dfrac{15(t - 2v)}{v}$

.....

(3)

(Total for Question 14 is 6 marks)

15



The area of triangle ABC is $6\sqrt{2}$ m^2.

Calculate the value of x.
Give your answer correct to 3 significant figures.

.....

(Total for Question 15 is 5 marks)

16 Using $x_{n+1} = -2 - \frac{4}{x_n^2}$

with $x_0 = -2.5$

(a) find the values of x_1, x_2 and x_3

$x_1 =$ .....

$x_2 =$ .....

$x_3 =$ .....

(3)

(b) Explain the relationship between the values of x_1, x_2 and x_3 and the equation $x^3 + 2x^2 + 4 = 0$

.....

.....

.....

.....

(2)

(Total for Question 16 is 5 marks)

17 A train travelled along a track in 110 minutes, correct to the nearest 5 minutes.

Jake finds out that the track is 270 km long.
He assumes that the track has been measured correct to the nearest 10 km.

(a) Could the average speed of the train have been greater than 160 km/h?
You must show how you get your answer.

(4)

Jake's assumption was wrong.
The track was measured correct to the nearest 5 km.

(b) Explain how this could affect your decision in part (a).

.....

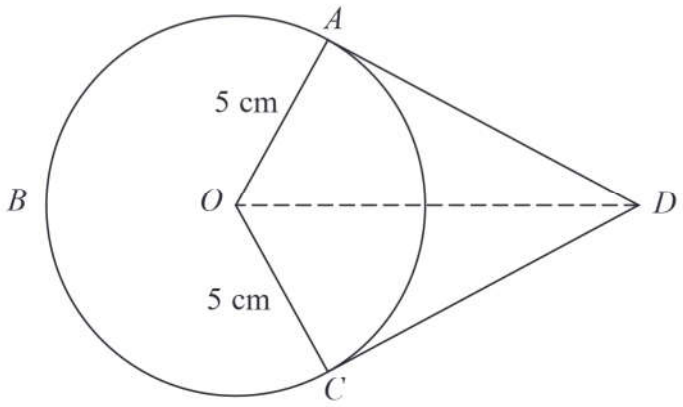
.....

.....

(1)

(Total for Question 17 is 5 marks)

18



A, *B* and *C* are points on a circle of radius 5 cm, centre *O*.
DA and *DC* are tangents to the circle.
DO = 9 cm

Work out the length of arc *ABC*.
Give your answer correct to 3 significant figures.

..... cm

(Total for Question 18 is 5 marks)

19 Solve $2x^2 + 3x - 2 > 0$

.....

(Total for Question 19 is 3 marks)

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20 The equation of a curve is $y = a^x$
A is the point where the curve intersects the y-axis.

(a) State the coordinates of A.

(..... , ...)

(1)

The equation of circle **C** is $x^2 + y^2 = 16$

The circle **C** is translated by the vector $\begin{pmatrix} 3 \\ 0 \end{pmatrix}$ to give circle **B**.

(b) Draw a sketch of circle **B**.

Label with coordinates
the centre of circle **B**
and any points of intersection with the x-axis.

(3)

(Total for Question 20 is 4 marks)

TOTAL FOR PAPER IS 80 MARKS