

# Year 10 Autumn Higher Assessment Mathematics

Name

Date

Time allowed 55 minutes. The maximum mark for this paper is 50.

## Instructions

- Use black ink or black ball-point pen
- Calculator allowed
- Draw diagrams in pencil
- Answer all questions
- You must answer the questions in the spaces provided
- Do all rough work in this booklet
- Cross through any work you do not want to be marked
- You must keep working until the end of the 55 minutes

#### Information

• The results of this assessment will be reported back to parents/carers.



# Test Analysis

Question		My Mark	Max Mark	Hegarty
1	Knowing parts of a circle		1	592
2	Roots of a Quadratic		1	230
3	Identifying a point on a curve		1	251
4	Fractions and Percentage Equivalence		1	75
5	Understanding Ratio notation		1	330
6	Using a calculator to work out the value of trigonometric expressions		3	130
7	Expanding and simplifying a pair of brackets		2	162
8	Using trigonometry to calculate missing angles and lengths		4	509 511
9	Working out the area of a shape involving circles		2	546
10	Simplifying Ratio		2	329
11	Applying Pythagoras Theorem		2	502
12	Working out the equation of a parallel line		2	214
13	Using trigonometry to work out the area of a non-right angled triangle		2	517
14	Completing and using a Tree Diagram		3	517
15	Interior Angles in a Polygon		3	561
16	Understanding Pythagoras and Trigonometry		1	509
17	Knowing and using the Quadratic formula		3	241
18	Problem solving with trigonometry		3	527
19	Drawing and using a Cosine graph		4	304
20	Problem solving with trigonometry		5	529
21	Factorising a Quadratic		4	228

## Circle the word that describes the straight line PQ



		<b>~</b> °		
chord	diameter	radius	tangent	I
Circle the <b>two roots</b>	s of $(x-5)(x+4) =$	0		
-5	5	-4	4	I
Circle the point that	lies on the curve $y =$	$x^{2} = 2x^{2} + 1$		
Circle your answer				
(-1,3)	(-1,5)	(-1,-1)	(-1,-3)	
Work out 50 as a pe	rcentage of 10			
Circle your answer				
5%	20%	400%	500%	
y is 4 times $x$ .				
Circle the ratio that i	s equivalent to <i>y</i> : <i>x</i>			

6 (a) Use your calculator to work out 8 sin 54°Give your answer to 1 decimal place

	Answer	[1]
(b)	Use your calcuator to work out $\frac{13}{\tan 50^\circ}$	
	Give your answer to the nearest integer	
	Answer	[1]
(c)	Use your calculator to work out $cos^{-1}\left(\frac{\sqrt{2}}{2}\right)$ Give the <b>correct units</b> with your answer	
	Answer	[1]

**7** Expand and simplify (2x + 7)(x - 3)

Answer	[2

- - (b) Work out the length *y*. Give your answer to 1 decimal place.



Answer\_

9 The diagram shows a quarter-circle with radius 6.5cm



Work out the area of the quarter-circle. Give your answer to 1 decimal place.

Answer\_\_\_\_\_

[2]

- 10 Adam and Ruth share an amount of money is the ratio 5: nAdam gets 30% of the money. Work out the value of *n* Answer \_\_\_\_\_ [2] 11 A circle has a diameter 10cm A square has side length 6cm Not drawn accurately 10 cm  $\leftarrow$  6 cm  $\rightarrow$ Use Pythagoras' theorem to show whether the square will fit inside the circle without touching the edge of the circle

12 Write down the equation of a straight line that is parallel to the line y = 2x + 3 and passes through the point (9, -8)

Answer \_\_\_\_\_ [2]

**13** Work out the area of this triangle to **3 significant figures** with  $x = 50^{\circ}$ 



**14** Bag A contains 3 red balls and 7 blue balls.

Bag B contains 8 red balls and 2 blue balls.



A ball is picked at random from each bag.

(a) Complete the tree diagram to show all the probabilities.



[2]

(b) Work out the probability of picking a **red** ball from Bag A and a **blue** ball from Bag B.



**15** A regular pentagon is drawn inside a regular octagon as shown.

Not drawn accurately



Calculate the size of angle p. You **must** show your working.

Answer \_\_\_\_\_ degrees [3]

**16** For this triangle which of the following is **not** true? Circle your answer.



$$a = \sqrt{c^2 - b^2}$$
 sin C = 1 sin A = cos B tan A =  $\frac{b}{a}$  [1]

Use the quadratic formula to solve  $5x^2 + 11x - 2 = 0$ Give your solutions to 2 decimal places.

Answer \_\_\_\_\_

[3]

**18** Two soldiers *A* and *B* leave the same base. Soldier *A* travels 9 km due North. Soldier *B* travels 10 km due South-West.

How far apart are the soldiers? Give your answer to 1 decimal place.

Answer \_\_\_\_\_ [3]

### **19(a)** Draw the graph $y = \cos \theta$ for all angles between 0° and 360°



[2]

**(b)** Solve  $2 \cos \theta = 1$  for all angles between  $0^{\circ}$  and  $360^{\circ}$ 

Answer \_\_\_\_\_ [2]

**20** The diagram shows a parallelogram.

Not drawn accurately x 9 cm 5 cm 11 cm Work out the size of angle *x*. (a) Answer \_\_\_\_\_ degrees [2] Work out the area of the parallelogram. (b) Answer \_\_\_\_\_ cm<sup>2</sup> [3]

<b>21 (a)</b> Fa	ctorise 3	$n^2 + 7n + 4$
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Answer	
/ #101001	
Hence, or otherwise, write 374 as the product of its prime factors.	

# **END OF TEST**