



TONBRIDGE SCHOOL

Sample Paper for Entrance into Year 12

MATHEMATICS

Time allowed: 45 minutes

There are 20 questions on this paper.

A correct answer is worth 2 marks.

A good attempt at a question is worth 1 mark.

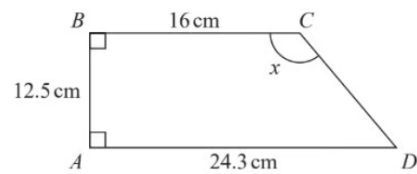
Calculators are allowed.

Question	Working	Answer
1	Expand and simplify: $3(2x + 4) - 2(2x - 5)$	
2	Factorise: $x^2 - 7x + 12$	

3

Write $\sqrt{4k} + \sqrt{25k}$ in the form $a\sqrt{k}$, where k is a prime.

4



Work out the size of angle x .
Give your answer correct to 1 decimal place.

5	Write $3x^2 - 12x - 7$ in the form $a(x + b)^2 + c$	
6	Find the gradient of the line perpendicular to $3y + 2x = 5$	

7	Make p the subject of $x = \frac{\sqrt{p}+3}{\sqrt{p}-5}$	
8	Solve for n : $\frac{3\sqrt{3}}{27^n} = \frac{1}{9}$	

9	Simplify fully: $\left(\frac{9x^2}{25y^4}\right)^{-\frac{1}{2}}$	
10	I flip a biased coin twice. The probability I get two tails is 0.49. What is the probability I get exactly one head?	

11	Write as a single fraction in its simplest form: $\frac{1}{x} + \frac{2}{3x} + \frac{4}{5x}$	
12	In a triangle, $AB = AC = 7\text{cm}$. $BC = 4\text{cm}$. Calculate the exact area in the form $k\sqrt{5}$.	

13	L_1 has equation: $3y + 5x = 12$. The line l_1 crosses the x-axis at P and the y –axis at Q. Find the area of OPQ (O is the origin).	
14	Simplify: $\frac{x^2-49}{x^2-5x-14}$	

15	Solve: $3x^2 - 2ax - 5a^2 \leq 0$ Give your answers in terms of a. Note that a is a positive constant.	
16	A sector has radius 8cm and area $\frac{32\pi}{3}$. Calculate the exact perimeter in terms of π.	

17	I drive to school every morning. I drive half the distance at 40mph and half the distance at 60mph. Overall, it takes me 45 mins. How far do I live from school?	
18	ABCD is a parallelogram. The length of AB is 8cm and the length of AD is 12cm. The area of ABCD is 20cm^2. Angle BAD is acute. Calculate the length of BD to one decimal place.	

19	Solve: $\frac{1}{2x} + \frac{1}{y+3} = 1\frac{5}{8}$ $\frac{1}{x} - \frac{1}{y-1} = 3\frac{1}{4}$	
20	Factorise: $x^4 + x^2 + 1$	