1st Class Maths

Video Solutions

SCAN ME

PRACTICE PAPER FOR

AQA Level 2 Further Maths

Paper 2 (June 2024)

---------- Disclaimer ----------

This paper has been created based on the topics that did not occur on paper 1 and those that frequently appear in past papers. The paper should be excellent at helping students revise for exams, however should not be relied upon as the basis for revision. The topics from this paper may well appear in the real exams, however there is absolutely no guarantee of this for the reasons previously mentioned. Some topics may appear, some may not.

Ultimately the best way to prepare for the exams is to **revise all topics**.

You can find a link to this paper and many more completely free resources at www.1stclassmaths.com

Answer **all** questions in the spaces provided.

Do not write outside the box

1 $5m(6y - 4) + 10(3 - my) \equiv 10y + n$

Work out the values of m and n **[4 marks]**

$m =$ _____ $n =$ _____

2 $f(x) = x^2 + k$ $g(x) = x - 7$

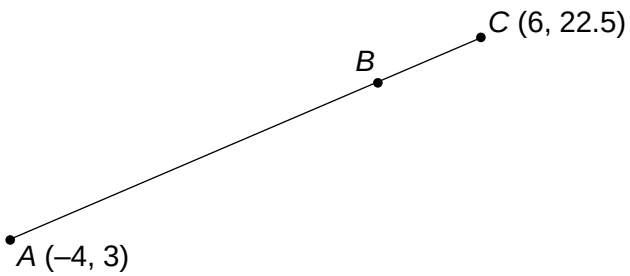
$fg(2) = 28$

Work out the value of k. **[2 marks]**

$k =$ _____

Do not write outside the box

3 ABC is a straight line with $AB : AC = 4 : 5$



Not drawn accurately

Work out the coordinates of B. **[4 marks]**

Answer (_____ , _____)

4 $y = -x^5$

Work out the rate of change of y with respect to x, when $x = 4$ **[3 marks]**

Answer _____

13

Do not write outside the box

5 The points $A(0, a)$ and $B(b, 2.5)$ are on the graph has the equation $y = 5 \times 2^x$

Work out the values of a and b **[3 marks]**

$a =$ _____ $b =$ _____

6 Simplify fully $\dfrac{6x^2 + 11x - 10}{2xy + 5y}$ **[3 marks]**

Answer _____

Do not write outside the box

7 $\mathbf{A} = \begin{pmatrix} 0 & a \\ 1 & 4 \end{pmatrix}$ $\mathbf{B} = \begin{pmatrix} 8 & 2 \\ b & 0 \end{pmatrix}$

AB = 2I where **I** is the identity matrix.

Work out the values of a and b. **[3 marks]**

$a =$ _____ $b =$ _____

8 $p + q : p - q = 6 : 1$

Work out $p : q$ giving your answer as a ratio in its simplest form. **[3 marks]**

$p : q =$ _____ : _____

12

Do not write outside the box

9 The function f is given by $f(x) = \dfrac{x + 3}{x - 8}$

9 (a) Give a reason why $x > 0$ is not a suitable domain for $f(x)$ **[1 mark]**

9 (b) Work out $f^{-1}(x)$ **[3 marks]**

$f^{-1}(x) =$ _____

9 (c) The function g is given by $g(x) = x^2$ with domain $x < -4$

Work out the range of the function. **[2 marks]**

Answer _____

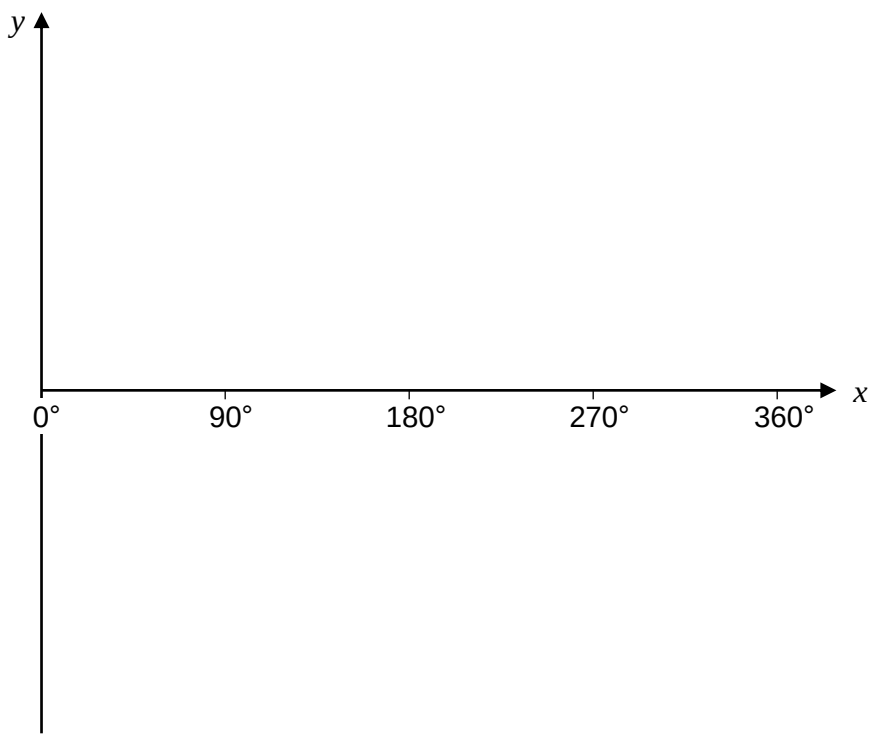
Do not write outside the box

9 (d) The function h is given by $h(x) = \sin(x) - 1$ for all x

Write down the range of the function. **[2 marks]**

Answer _____

9 (e) On the axes, sketch the graph of $y = h(x)$ for $0° \leqslant x \leqslant 360°$ **[2 marks]**



10

Do not write outside the box

10 $b\%$ of $5a = a\%$ of $(a - b)$

Given that $a > 0$, write a in terms of b. **[4 marks]**

Answer _____

11 Expand and simplify fully $(x^3 + y^2)(x^3 - y^2)(x + y)$ **[3 marks]**

Answer _____

Do not write outside the box

12 A cone and sphere both have the same radius, r.

volume of the cone : volume of the sphere = 2 : 5

Volume of a cone = $\frac{1}{3}\pi r^2 h$ where r is the radius h is the perpendicular height.	Volume of a sphere = $\frac{4}{3}\pi r^3$ where r is the radius

Express h, the perpendicular height of the cone, in terms of r. **[4 marks]**

Answer _____

11

Do not write outside the box

13 For a linear sequence,

The 5th term = $360 - 60a$
The 8th term = $360 - 69a$

All of the terms of the sequence are negative.

Work out a set of possible values for a.

[4 marks]

Answer _____

Do not write outside the box

14 Solve the simultaneous equations

$$2a + b + 2c = 2$$
$$a + 2b - 4c = 6$$
$$3a - b + 6c = -8$$

Do **not** use trial and improvement.

You **must** show your working.

[5 marks]

$a =$ _____ $b =$ _____ $c =$ _____

9

Do not write outside the box

15 The coefficient of x^2 in the expansion of $(3 + ax)^4$ is 12150

Given that $a > 0$, work out the value of a.

[3 marks]

Answer _____

16 Solve $5\cos^2\theta - 3\cos\theta = 0$ for $0° \leq \theta \leq 360°$ **[4 marks]**

Answer _____

Do not write outside the box

17 (a) P is the point on the curve $y = 2x^3 - x^2 - 3x$ where $x = -0.5$

Work out the equation of the tangent to the curve at P.

Give your answer in the form $ay + bx = c$ where a, b and c are integers. **[5 marks]**

Answer _____

17 (b) The tangent at P also intersects the x-axis at Q.

Show that the point Q is also on the curve $y = 2x^3 - x^2 - 3x$ **[4 marks]**

16

Do not write outside the box

18 $f(x) = \frac{4}{3}x^3 - 2ax^2 + 9x + 7$

$f(x)$ is an increasing function for all values of x.

Work out a set of possible values for a. **[5 marks]**

Answer _____

Do not write outside the box

19 Integers are made using some of the digits 1, 2, 3, 5, 8, and 9.

Each integer made

is greater than 70000
has no digit repeated
is even

How many integers can be made? **[4 marks]**

Answer _____

9