BUMPER "BETWEEN PAPERS (2 \$ 3)" PRACTICE SUITABLE FOR HIGHER TIER ONLY

SUMMER 2019

estions

ANSWERS - Charles to Safly McMillen NOT A "BEST" GUESS PAPER. & Joe Fisher.

YOU ALSO NEED TO **REMEMBER** THAT JUST BECAUSE A TOPIC CAME UP ON PAPER 1 OR 2 IT MAY STILL COME UP ON PAPER 3 ...

NEITHER IS IT A "PREDICTION" ... ONLY THE EXAMINERS KNOW WHAT IS GOING TO COME UP! FACT!

WE KNOW HOW IMPORTANT IT IS TO PRACTICE, PRACTICE, PRACTICE SO WE'VE COLLATED A LOAD OF QUESTIONS THAT WEREN'T EXAMINED IN THE AQA 9-1 GCSE MATHS PAPER 1 OR 2 BUT WE CANNOT GUARANTEE HOW A TOPIC WILL BE EXAMINED IN THE NEXT PAPERS ...

> Enjoy! Mel & Seager



Q2. There are 14 boys and 12 girls in a class.

Work out the total number of ways that 1 boy and 1 girl can be chosen from the class.

$$14 \times 12 = 168$$
 (2)

Q3. y is directly proportional to x.

Which graph shows this?





(5)

[1]





Circle the correct letter.

The diagram shows a pentagon ABCDE. DC is parallel to AB. 1.12 The size of an exterior angle at A is 67 Diagram NOT The size of an exterior angle at B is 112 accurately drawn The size of an exterior angle at C is xThe size of an exterior angle at D is 74 The size of an exterior angle at E is y68 (a) (i) Work out the value of x. 113 67° **68°** 68° (alterate angles are equal (ii) Work out the value of y. A 112° 360 - (74+68+112+67) = 39 (4) (b) Work out the sum of the interior angles of the pentagon ABCDE. 1/1 + 106 + 1/2 + 68 + 1/3(2) Q5. There are 6 batteries in a small packet of batteries. There are 9 batteries in a large packet of batteries. Chow buys *m* small packets of batteries and *g* large packets of batteries. The total number of batteries Chow buys is T. Write down a formula, in terms of m and g, for T. T= 6m+9g (3) Q6. The diagram shows a right-angled triangle and a rectangle.



The area of the triangle is twice the area of the rectangle.

(i) Write down an equation for x.

Q4.

$$36x + 18 = 2(70 - 72c)$$

 $36x + 14x = 140 - 18$

50x = 122

(ii) Find the area of the rectangle.

Show clear algebraic working.

$$x = \frac{122}{50} = 2.44$$

$$= 76 - 7 \times 2.44 = 52.92$$

(7)

Q7. Here is a trapezium.

c=-ll7

C

C



Q8. The diagram shows a rectangular playground of width x metres and length 3x metres.



The playground is extended, by adding 10 metres to its width and 20 metres to its length, to form a larger rectangular playaround.

The area of the larger rectangular playground is double the area of the original playground. (a) Show that $3x^2 - 50x - 200 = 0$

$$3x^{2} \times 2 = (x+16)(3x+20)$$

$$6x^{2} = 3x^{2} + 20x + 30x + 200$$
(b) Calculate the area of the original playground.
(3)
$$a=3$$

$$b=-50$$

$$c=-200$$
(3)
$$c=-200$$

Q9. Solve $2x^2 - 6x + 3 - 0$ Give your solutions correct to 3 significant figures.

Q10. Show that (x + 1)(x + 2)(x + 3) can be written in the form $ax^3 + bx^2 + cx + d$ where a, b, c and d are positive integers $(x^2+3x+2)(x+3) = x^3+3x^2+3x^2+9x+2x+6$ $= x^{3} + bx^{2} + 11x + 6$.

Compiled by JustMaths - this is NOT a prediction paper and should not be used as such!

(3)

Q11. (a) Complete the table of values for $y = x^3 - 3x^2 + 5$

| x | -2 | -1 | 0 | 1 | 2 | 3 | 4 |
|---|-----|----|---|---|---|---|----|
| у | -15 | 1 | 5 | 3 | Ł | S | 21 |

y

25

20

15

10

-10

-15

-need to draw the line -2x+1

(1)

3

(1)

x=-2-2(-2)+1=5 x=-1-2(-1)+1=3 x=3-2×(3)+1=5

(b) On the grid, complete the graph of $y = x^3 - 3x^2 + 5$ for $-2 \le x \le 4$

(1)

(c) Use the graph to find an estimate for the solution of the equation $x^3 - 3x^2 + 5$ = 0

-1.1

(1)

(d) By drawing a suitable straight line on the grid, find an estimate for the solution of the equation $x^3 - 3x^2 + 2x + 3x^2 + 3x^2 + 2x + 3x^2 + 3$ 4 = 0

$$x^{3} - 3x^{2} + 2x + 4$$

graph $+ 2x - 1$
 $x^{3} - 3x^{2} + 5$

$$\frac{x^{3}-3x^{2}+5+2x-1=0}{x^{3}-3x^{2}+5=-2x+1}$$

Q12. (a) Show that the equation $2x^3 + 4x = 3$ has a solution between 0 and 1

$$2x^{3} + 4x = 3 \text{ can be rearranged to give} \begin{array}{c} x = \frac{3}{4} - \frac{x^{3}}{2} \end{array}$$

C)

(b

$$49c = 3 - 2x^{3}$$

 $\div 4 = 3 - 2x^{3}$
 $\div 4 = 3 - 2x^{3}$
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(c) Starting with
$$x_0 = 0$$
, use the iteration formula $x_{n+1} = \frac{3}{4} + \frac{x^2}{2}$ times to find an estimate for the solution to $2x^2 + 4x + 3$
 $x_0 = 0$
 $x_0 = 3/4$, $y_{0-1} = 2x^2 + 3/4 + \frac{6}{2} + \frac{5}{2} = 0.5584$.
(3)
(3) It is directly proportional to \sqrt{x} $T = 400$ when $x = 625$
(4) Find a formula for T in terms of x
 $T = 1/5 \times \sqrt{35} + 2/525$ $T = 1/20$
(4)
(5) Colculate the value of T when $x = 56.25$
 $T = 1/5 \times \sqrt{35} + 2/525$ $T = 1/20$
(1)
(2) Colculate the value of T when $x = 56.25$
The cone has height $h cm$.
Core $= \frac{1}{3}\pi(3)^2h + \frac{1}{3}\pi(7^2h)$.
 $= \frac{1}{3}\pi(2h)^2h + \frac{1}{3}\pi(7^2h)$.
 $= \frac{1}{3}\pi(2h)^2h + \frac{1}{3}\pi(7^2h)$.
 $= \frac{1}{4}h$.
(3)
(4) Colculate the value of the sphere is equal to the value of the base of the cone is 3 times the radius of the sphere.
Core $= \frac{1}{3}\pi(3(2h)^2h + \frac{1}{3}\pi(7^2h)$.
 $= \frac{1}{3}\pi(2h)^2h + \frac{1}{3}\pi(7^2h)$.
 $= \frac{1}{3}\frac{1}{4}(3(2h)^2h + \frac{1}{3}\pi(7^2h)$.
 $= \frac{1}{3}\frac{1}{4}h$.
(3)
(4) Cond a formula for y in terms of x .
 $y = 250 + 2 \times 103$
 $y = 8x^{-3}$
 $2.50 + 2 \times 103$
 $x = 0.25$ $y = 0.25x^{-3}$.
(3)
(4) Conduct the value of x when $y = 51$
 $5x^2h - 2x^5$ $x = 6$.
(4)
Che hemisphere has a total surface area of $\frac{15}{3}\pi cm^2$.
The hemisphere has a total surface area of $\frac{15}{3}\pi cm^2$.
The hemisphere has a value of $k\pi cm^3$.
Find the value of k .
Complete by substathe - this hold a prediction paper and should not be used as such $\frac{118}{16}$ $T = 1.218$ T.
 $\frac{1}{8}$ $\frac{1}{8}$

Q17. Solve $\frac{3}{(x+1)} + \frac{2}{(2x-3)} = 1$

Show clear algebraic working.

$$3(2x-3) + 2(x+1) = 1$$

$$(x+1)(2x-3)$$

$$6x-9 + 2x+2 = 2x^{2} - 3x + 2x-3$$

$$0 = 2x^{2} - 9x + 4$$

$$(2x-1)(x-4) = 0 \quad x = \frac{1}{2} = 4$$
(5)

Q18. Solve the simultaneous equations

$$y = 3x + 2$$

$$x^{2} + y^{2} = 20$$

$$x^{2} + (3x + 2)^{2} - 20 = 0$$

$$x^{2} + 9x^{2} + 6x + 6x + 4 = 0$$

$$x^{2} + 9x^{2} + 6x + 6x + 4 = 0$$

$$x^{2} + 9x^{2} + 6x + 6x + 4 = 0$$

$$x^{2} + 9x^{2} + 6x + 6x + 4 = 0$$

$$x^{2} = 4, x = -2$$

$$y = 4, x = 9 = -4$$
(6)

Comparison of the cylinder inside a cone on a horizontal base.
The cone and the cylinder inside a cone on a horizontal base.
The cone and the cylinder have the same vertical axis.
The base of the cone.
The circumference of the top face of the cone.
The height of the cone is 12cm and the radius of the base of the cone is 4cm.
(a) Work out the curved surface area of the cone.
Give your answer correct to 3 significant figures.
$$\pi + f = \pi + 1 + 2\pi + 1 + 3 = 1 + 20\pi^{2}$$
The cylinder has radius r cm and volume V cm³
(b) Show that V = 12\pi + 2 - 3\pi^{3}
$$V = \pi + 2 + 12\pi + 2 - 3\pi^{3}$$

$$V = \pi + 2 + 3\pi + 3$$

$$= \pi + 2 + 3\pi + 3$$

$$= \pi + 2 + 3\pi + 3$$
(b) Show that V = 12\pi + 2 - 3\pi + 3
$$= 12 + 3\pi + 2 - 3\pi + 3$$

(4)