

Name: _____

Mathematics Bridging Assignment

Scores:-

Number: /25

Graphs of Functions: /12

Algebra: 33

Total: /70

A) NUMBER.

Laws of Indices

1. Evaluate:

i) 3^{-2}

.....(1)

ii) $36^{1/2}$

.....(1)

iii) $27^{2/3}$

.....(1)

iv) $(\frac{16}{81})^{-3/4}$

.....(2)

(Total 5 marks)

2. $n^{-\frac{2}{3}} = \frac{1}{25}$

Find the value of n.

n=.....

(Total 2 marks)

Standard Form

3. Work out $(4 \times 10^3) \div (8 \times 10^5)$

Give your answer in standard form:

.....
(Total 2 marks)

4. a) Write 5 720 000 in standard form.

.....(1)

$$p = 5\,720\,000 \quad q = 4.5 \times 10^5$$

b) Find the value of $\frac{p-q}{(p+q)^2}$

Give your answer in standard form to 2 significant figures.

.....(2)
(Total 3 marks)

SURDS

5. Simplify.

a) $\sqrt{18} + \sqrt{50}$

.....(2)

b) i) Rationalise the denominators of $\frac{21}{\sqrt{7}}$ and simplify your answer.

.....(2)

ii) Rationalise the denominators of $\frac{1}{2+\sqrt{3}}$ and simplify your answer.

.....(2)

(Total 6 marks)

6. Expand $(\sqrt{5} + 2\sqrt{3})(\sqrt{5} - 2\sqrt{3})$

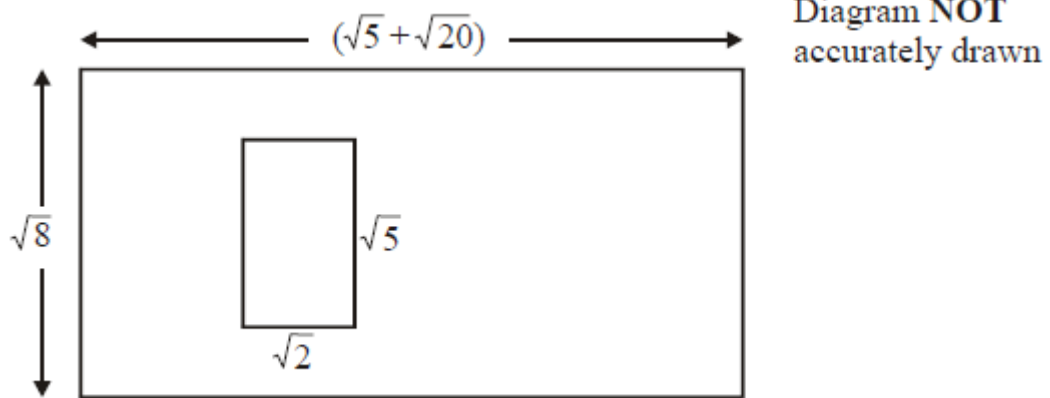
Express your answer as simply as possible.

.....(2)

(Total 2 marks)

7. a) Given that $\sqrt{40} = k\sqrt{10}$, find the value of k.

$k = \dots\dots\dots(1)$



A large rectangle piece of card is $(\sqrt{5} + \sqrt{20})$ cm long and $\sqrt{8}$ cm wide.
 A small rectangle $\sqrt{5}$ cm long and $\sqrt{2}$ cm wide is cut out of the piece of card.

b) Express the area of the card that is left as a percentage of the area of the large rectangle.

$\dots\dots\dots\%$ (4)

(Total 5 marks)

B) GRAPHS OF FUNCTIONS

8. A straight line L, has equation $3y = 5x - 6$

Find

i) The gradient of L,

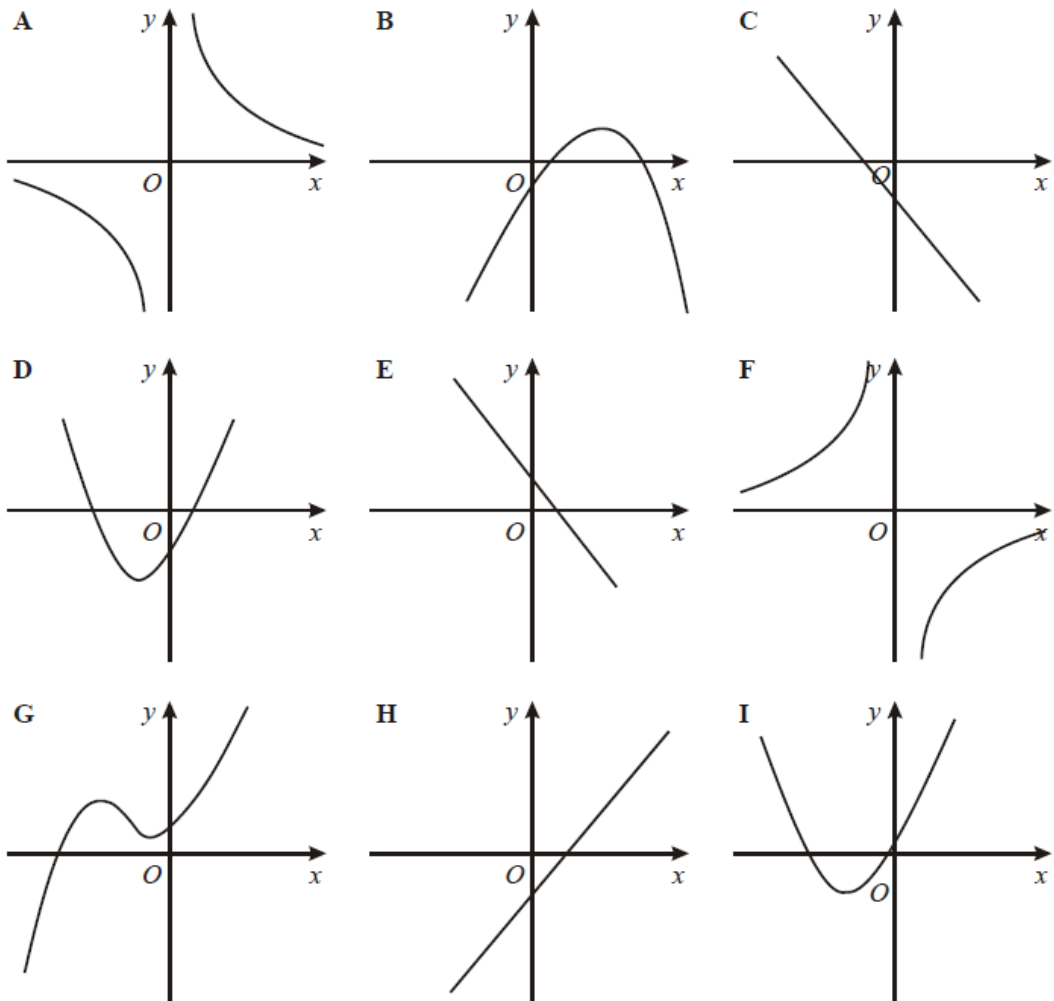
.....(1)

ii) The y- co-ordinate of the point where L cuts the y-axis.

(0,...).....(1)

(Total 2 marks)

9.



Write down the letter of the graph which could have the equation

i) $y=3x - 2$

.....(1)

ii) $y = 2x^2 + 5x - 3$

.....(1)

iii) $y = \frac{3}{x}$

.....(1)

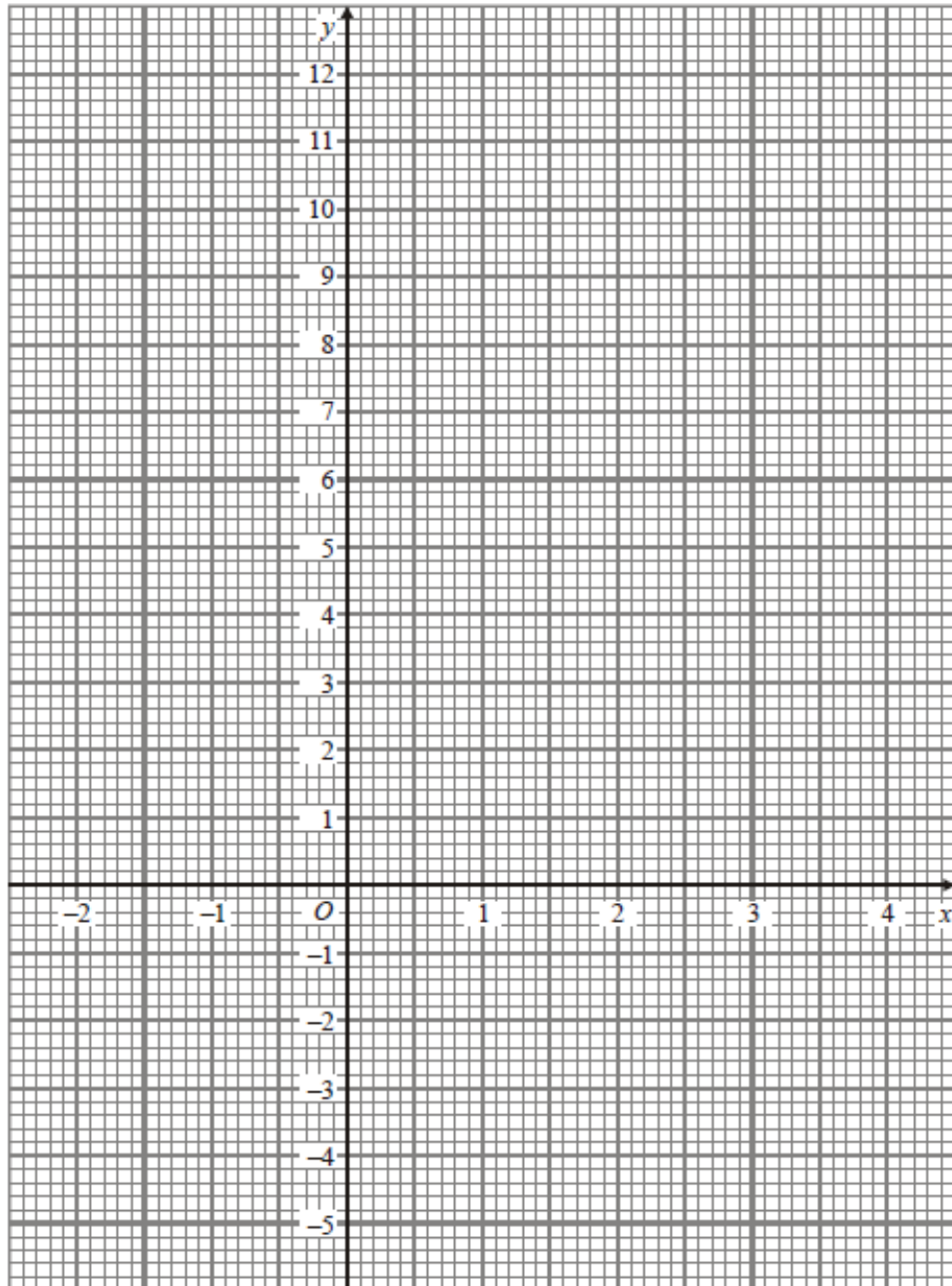
(Total 3 marks)

10. a) Complete the table for $y = x^2 - 3x + 1$

x	-2	-1	0	1	2	3	4
y	11		1	-1		1	5

b) On the grid Draw the graph of $y = x^2 - 3x + 1$

(2)

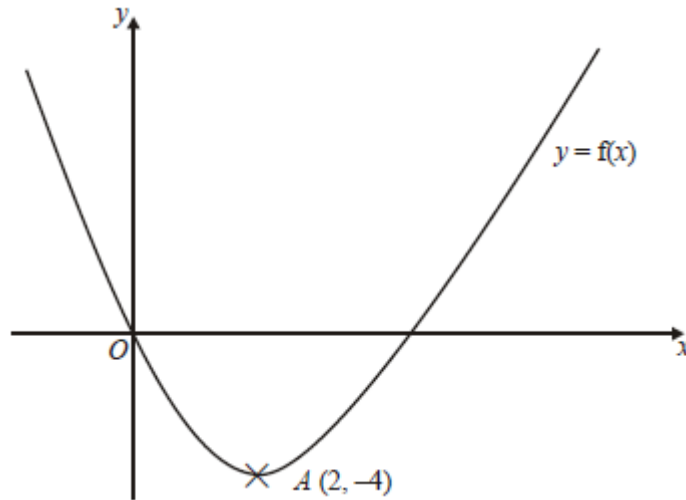


c) Use your graph to find an estimate for the minimum value of y .

$y = \dots\dots\dots(1)$

(Total 3 marks)

11. This is the sketch of the curve with the equation $y = f(x)$
It passes through the origin O.



The only vertex of the curve is A(2, - 4)

Write down the coordinates of the vertex of the curve with equation.

- i) $y=f(x - 1)$ (.....,)
- ii) $y=f(x) - 5$ (.....,)
- iii) $y= -f(x)$ (.....,)
- iv) $y=f(2x)$ (.....,)

(4)
(Total 4 marks)

C) ALGEBRA – Manipulating Expressions and Solving Equations

12. Simplify fully

a) $2(3x + 4) - 3(4x - 5)$

.....(2)

b) $(2xy^3)^5$

.....(2)

c) $(7x - 2)^2$

.....(2)

d) $\frac{n^2-1}{n+1} \times \frac{2}{n-2}$

.....(3)

e) $\frac{x^2-3x}{x^2-8x+15}$

.....(3)
(Total 12 marks)

13. Factorise the following expression.

$$3x^2 + 10x - 8$$

.....(2)
(Total 2 marks)

14.

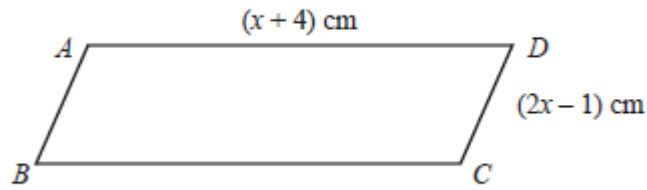


Diagram **NOT** accurately drawn

ABCD is a parallelogram

$$AD = (x + 4) \text{ cm}$$

$$CD = (2x - 1) \text{ cm}$$

The perimeter of the parallelogram is 24cm

i) Use the information to write down an equation in terms of x .

.....(1)

ii) Solve your equation.

$$x = \text{.....}(2)$$

(Total 3 marks)

15. The expression $x^2 - 6x + 14$ can be written in the form $(x - p)^2 + q$

by completing the square, for all values of x . Find the value of p and q .

$p = \dots\dots\dots$

$q = \dots\dots\dots$

(Total 3 marks)

16. Solve the simultaneous equations.

$$3x - 4y = 11$$

$$5x + 6y = 12$$

$x = \dots\dots\dots$

$y = \dots\dots\dots$

(Total 4 marks)

17.

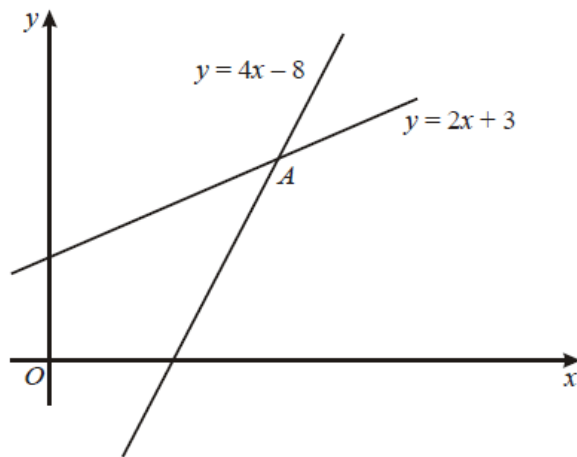


Diagram **NOT** accurately drawn

The diagrams show two straight lines intersecting at point A.
The equations of the lines are

$$y = 4x - 8$$

$$y = 2x + 3$$

Work out the coordinates of A.

(..... ,)
(Total 2 marks)

18.

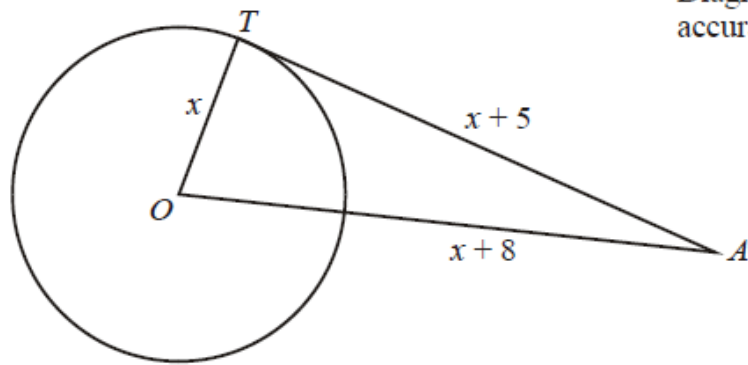


Diagram **NOT**
accurately drawn

AT is a tangent at T to a circle centre O.

$OT = x \text{ cm}$, $AT = (x + 5) \text{ cm}$, $OA = (x + 8) \text{ cm}$

a) Show that $x^2 - 6x - 39 = 0$

(4)

b) Solve the equation $x^2 - 6x - 39 = 0$ to find the radius of the circle.
Give your answer correct to 3 significant figures.

.....cm (3)
(Total 7 marks)