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)

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

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

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 $\dfrac{21}{\sqrt{7}}$ and simplify your answer.

…………………………(2)

ii) Rationalise the denominators of $\dfrac{1}{2+\sqrt{3}}$ 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)

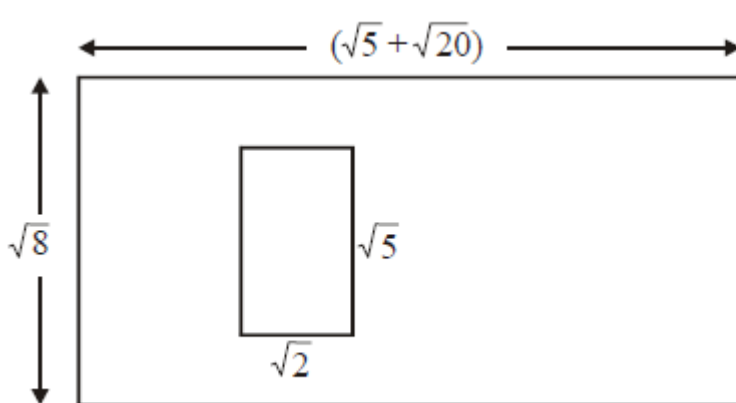7. a) Given that $\sqrt{40}=k\sqrt{10}$, find the value of k.

$k =$…………………………(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.

……………………………% (4)
(Total 5 marks)

B) GRAPHS OF FUNCTIONS
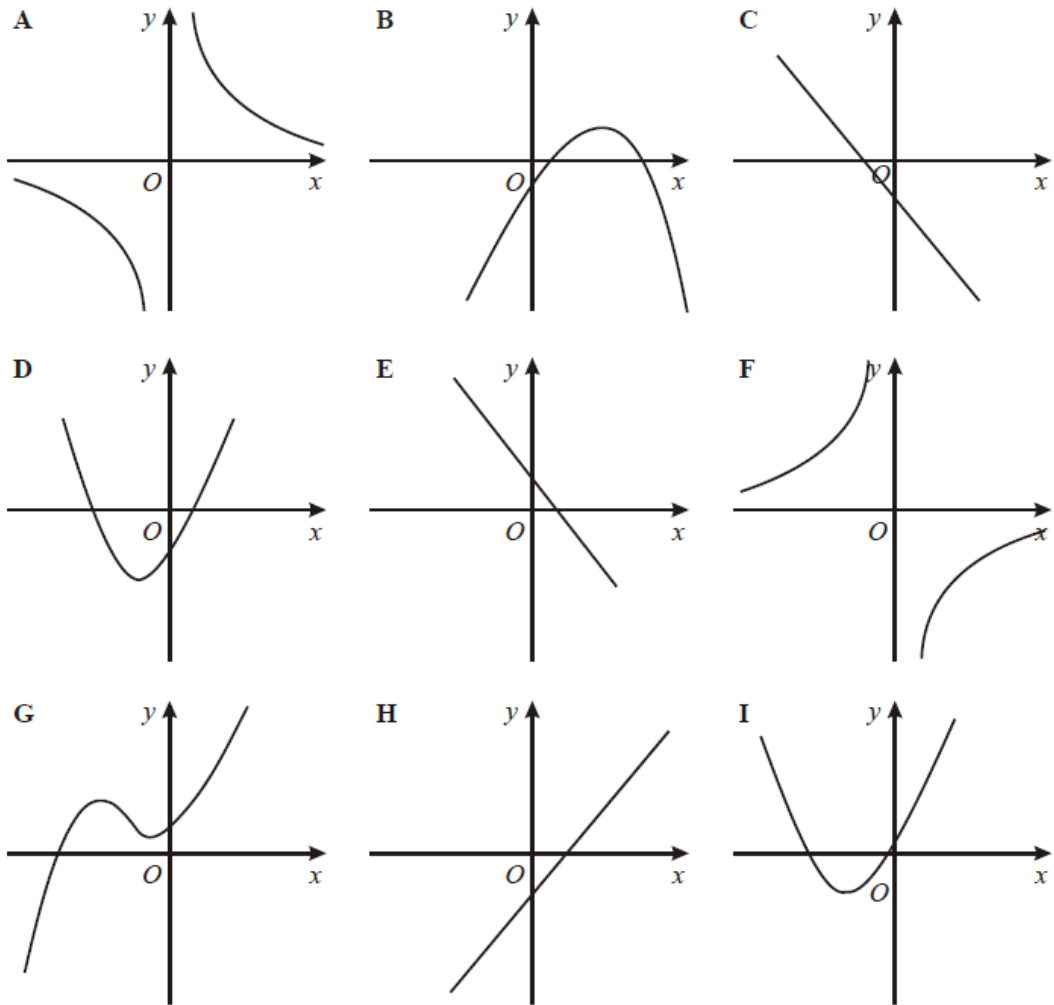
8. A straight line L, has equation $3y = 5x - 6$
       Find
         i)   The gradient of L,

………………………(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) $y = \dfrac{3}{x}$

..................................(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)
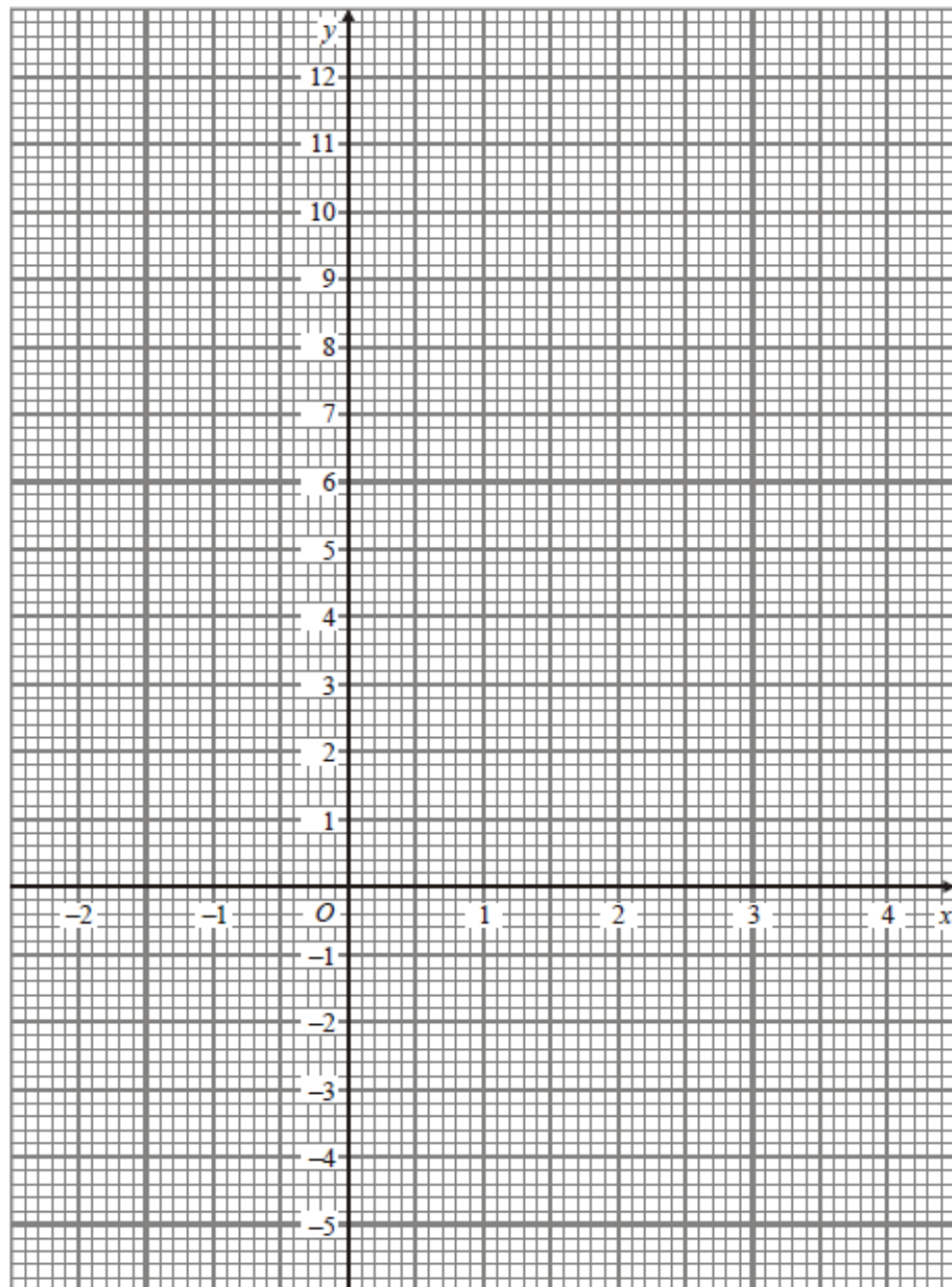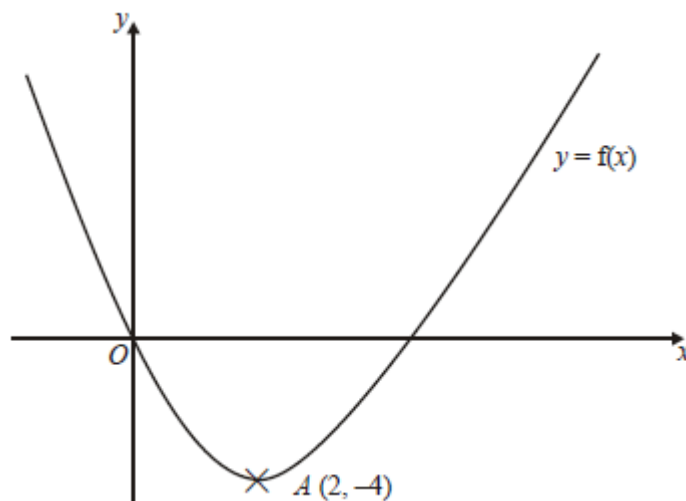

c) Use your graph to find on estimate for the minimum value of y.

y=……………………….(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) $\dfrac{n^2-1}{n+1} \times \dfrac{2}{n-2}$

..............................(3)

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

..............................(3)

(Total 12 marks)

13. Factorise the following expression.

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

…………………………(2)
(Total 2 marks)

14.

(x + 4) cm

A

D

(2x – 1) cm

B

C
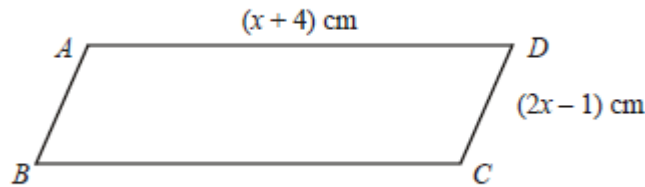
Diagram **NOT** accurately drawn

ABCD is a parallelogram
AD = $(x + 4)cm$
CD = $(2x - 1)cm$
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.

$x =$…………………………(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=…………………………

q=…………………………

(Total 3 marks)

16. Solve the simultaneous equations.

3x – 4y = 11

5x + 6y = 12

$x =$…………………………

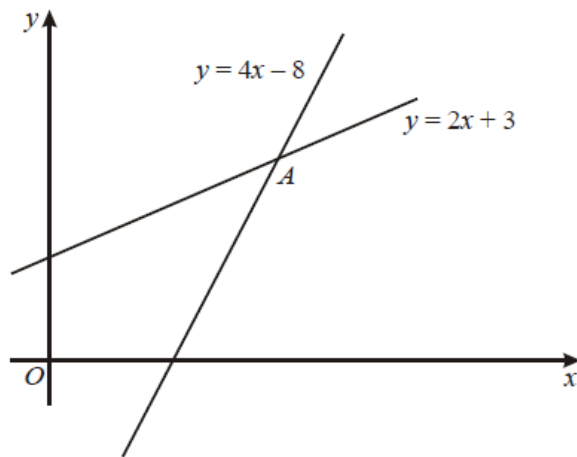$y =$…………………………

(Total 4 marks)

17.

Diagram **NOT** accurately drawn

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

$$y = 4x - 8$$

$$y = 2x + 3$$

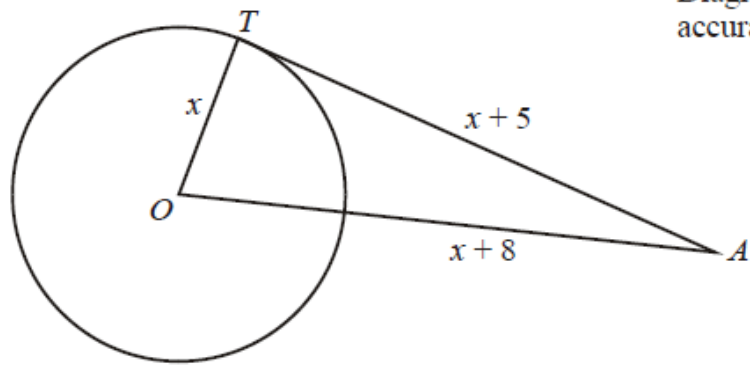Work out the coordinates of A.

(……. , ……)
(Total 2 marks)

18.

Diagram **NOT** accurately drawn

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

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

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)