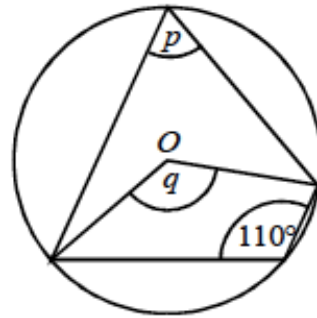


## Revision F5 (All topics) B [45]

1.

$O$  is the centre of the circle.



not drawn accurately

(a) Calculate the value of angle  $p$ .

(2)

(b) Calculate the value of angle  $q$ .  
Give a reason for your answer.

(2)

(Total 4 marks)

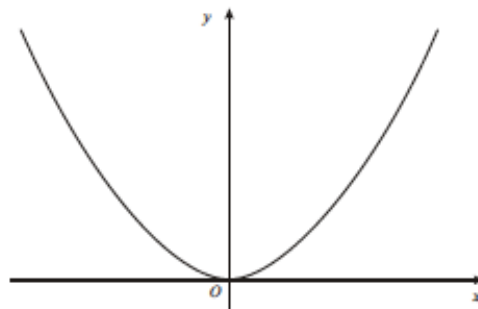
2.

Simplify  $\frac{3x^2 + x - 2}{9x^2 - 4}$

(Total 4 marks)

3.

The sketch below is of the graph of  $y = x^2$



On suitable axes, sketch the following graphs.

The graph of  $y = x^2$  is shown dotted on each set of axes to act as a guide.

(a)  $y = x^2 + 2$

(1)

(b)  $y = (x - 2)^2$

(1)

4.

$c$  is a positive integer.

Prove that  $\frac{6c^3 + 30c}{3c^2 + 15}$  is an even number.

[3 marks]

5.

(a) Prove that the sum of four consecutive whole numbers is always even.

(b) Give an example to show that the sum of four consecutive integers is **not** always divisible by 4.

(Total 5 marks)

6.

- (a) Copy and complete the table of values for  $y = 3x^2 - 2x + 1$

$x$	-3	-2	-1	0	1	2	3	4
$y$	34	17	6	1	2		22	41

(1)

- (b) On a grid  $-3 \leq x \leq 4$  (2 cm = 1 unit),  $-10 \leq y \leq 50$  (2 cm = 10 units), draw the graph of  $y = 3x^2 - 2x + 1$ .

(2)

- (c) By drawing an appropriate linear graph, write down the solutions of

$$3x^2 - 6x + 2 = 0$$

(3)

(Total 6 marks)

7.

There are  $y$  black socks and 5 white socks in a drawer.

Joshua takes at random two socks from the drawer.

The probability that Joshua takes one white sock and one black sock is  $\frac{6}{11}$

- (a) Show that  $3y^2 - 28y + 60 = 0$

- (b) Find the probability that Joshua takes two black socks.

(Total 7 marks)

8.

Write  $27^{\frac{2}{3}}$  in the form  $\frac{1}{n}$  where  $n$  is an integer.

(Total 2 marks)

9.

- (a) Show that  ${}^{15}\sqrt{8^5} = 2$ .

- (b) Write  ${}^8\sqrt{27 \times 3}$  in the form  $3^k$ , where  $k$  is a fraction in its simplest form.

(Total 5 marks)

10.

**Non-calculator**

Rationalise the denominator in this surd

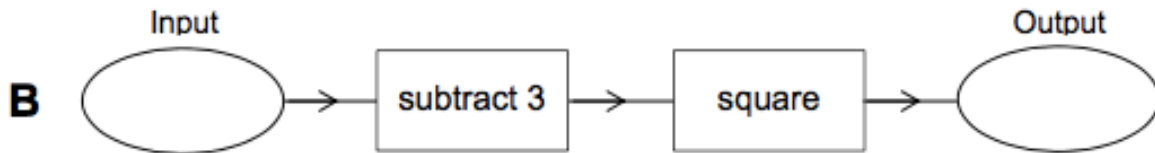
$$\frac{3+4\sqrt{7}}{\sqrt{7}-2}$$

Simplify your answer where possible.

(Total 5 marks)

11.

Here are two function machines, **A** and **B**.



Both machines have the same input.

Work out the range of input values for which

the output of **A** is **less** than the output of **B**.

**[4 marks]**