

7

- (4)

(Total 4 marks)

--	--

(4)

(Total 4 marks)



3. On separate diagrams, sketch the graphs of

(a) $y = (x + 3)^2$, (3)

(b) $y = (x + 3)^2 + k$, where k is a positive constant. (2)

Show on each sketch the coordinates of each point at which the graph meets the axes.





5. Differentiate with respect to x

(a) $x^4 + 6\sqrt{x}$,

(3)

(b) $\frac{(x+4)^2}{x}$.

(4)



- (2)

(2)

7. An athlete prepares for a race by completing a practice run on each of 11 consecutive days. On each day after the first day, he runs further than he ran on the previous day. The lengths of his 11 practice runs form an arithmetic sequence with first term a km and common difference d km.

He runs 9 km on the 11th day, and he runs a total of 77 km over the 11 day period.

Find the value of a and the value of d .

(7)



8. The equation $x^2 + 2px + (3p + 4) = 0$, where p is a positive constant, has equal roots.

(a) Find the value of p .

(4)

(b) For this value of p , solve the equation $x^2 + 2px + (3p + 4) = 0$.

(2)



9. Given that $f(x) = (x^2 - 6x)(x - 2) + 3x$,

(a) express $f(x)$ in the form $x(ax^2 + bx + c)$, where a , b and c are constants.

(3)

(b) Hence factorise $f(x)$ completely.

(2)

(c) Sketch the graph of $y = f(x)$, showing the coordinates of each point at which the graph meets the axes.

(3)





(Total 10 marks)

--	--



11. The line l_1 passes through the points $P(-1, 2)$ and $Q(11, 8)$.

(a) Find an equation for l_1 in the form $y = mx + c$, where m and c are constants.

(4)

The line l_2 passes through the point $R(10, 0)$ and is perpendicular to l_1 . The lines l_1 and l_2 intersect at the point S .

(b) Calculate the coordinates of S .

(5)

(c) Show that the length of RS is $3\sqrt{5}$.

(2)

(d) Hence, or otherwise, find the exact area of triangle PQR .

(4)



(Total 15 marks)

END

