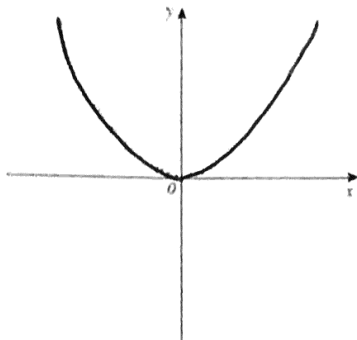


End of Unit Test Name: Answers
Sequences, Functions and Graphs - HIGHER

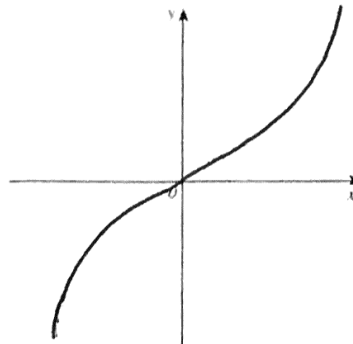


1. Sketch the graphs of:

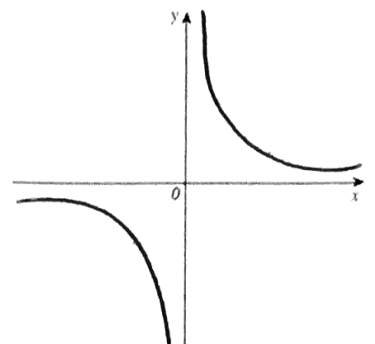
(a) $y = x^2$



(b) $y = x^3$



(c) $y = \frac{1}{x}$



(Total 3 marks)

2. (a) Line M has the equation $3x + 2y = 7$. Circle the gradient of line M.

- 3 $-\frac{3}{2}$ 3 $\frac{3}{2}$

(1)

(b) Line N has the equation $y = 5 - \frac{3}{4}x$.
 Circle the gradient of a line that is perpendicular to line N.

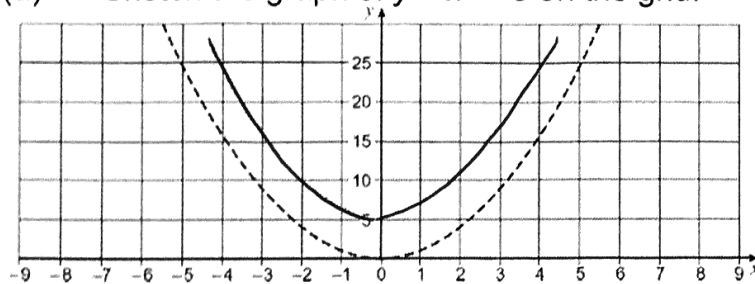
- $-\frac{4}{3}$ $\frac{3}{4}$ $\frac{4}{3}$ 3

(1)

(Total 2 marks)

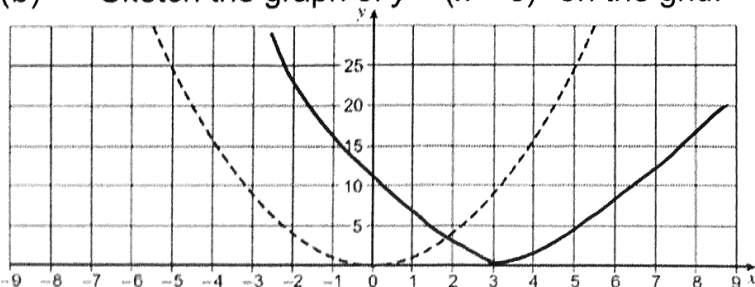
3. On each grid, the graph of $y = x^2$ is shown dashed to help you.

(a) Sketch the graph of $y = x^2 + 5$ on the grid.



(1)

(b) Sketch the graph of $y = (x - 3)^2$ on the grid.



(1)

(Total 2 marks)

4. Work out an expression for the n th term of the quadratic sequence

11 15 21 29 39

+4 +6 +8 +10
+2 +2 +2

$$2 \div 2 = 1 \therefore n^2$$

T 11 15 21 29 39

n^2 1 4 9 16 25

$T - n^2$ 10 11 12 13 14

→
+1

$$n\text{th term} = n^2 + n + 9$$

(Total 4 marks)

5. $f(x) = 3x$. Circle the expression for $f^{-1}(x)$

$-3x$

$\frac{3}{x}$

$\frac{1}{3x}$

$\frac{x}{3}$

(Total 1 mark)

6. $f(x) = 2x + c$ $g(x) = cx + 5$ $fg(x) = 6x + d$
 c and d are constants. Work out the value of d .

$$f \cdot g(x) = 2(cx + 5) + c$$

$$= 2cx + (10 + c)$$

$$c = 3, d = 13$$

7. The diagram shows the circle $x^2 + y^2 = 10$. P lies on the circle and has x -coordinate 1. The tangent at P intersects the x -axis at Q . Work out the coordinates of Q .

$$1^2 + y^2 = 10, y = 3 \quad (1, 3)$$

$$\text{Gradient } OP = 3$$

$$\text{Gradient } PQ = -\frac{1}{3}$$

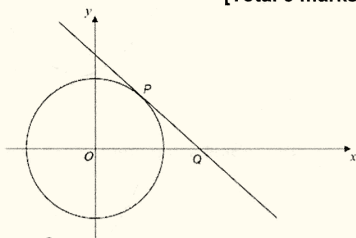
$$y = -\frac{1}{3}x + c \rightarrow y = -\frac{1}{3}x + \frac{10}{3}$$

$$0 = -\frac{1}{3}x + \frac{10}{3}$$

$$x = 10$$

Answer 13

[Total 3 marks]



Answer (..... 10 0) (Total 5 marks)

(Total for test = 20 marks)