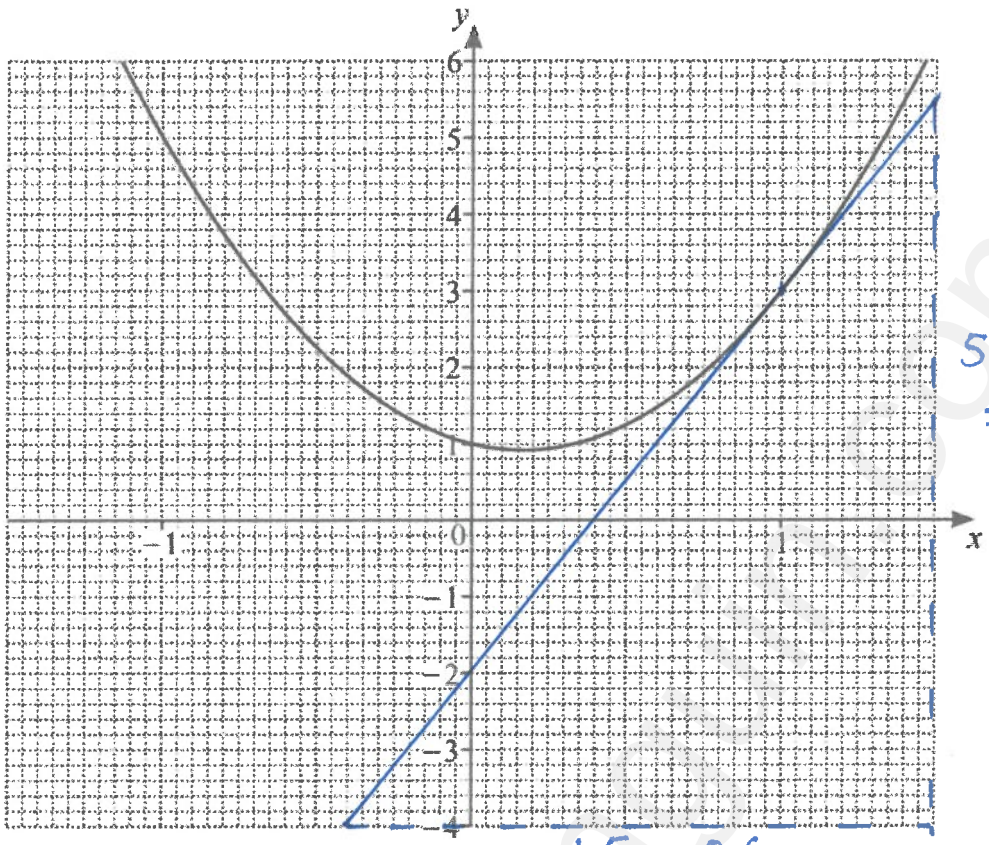
(b)



(i) On the grid, draw the tangent to the curve at $x = 1$. [1]

(ii) Use your tangent to estimate the gradient of the curve at $x = 1$.

$$\text{gradient} = \frac{\text{change in } y}{\text{change in } x} = \frac{9.4}{1.9} = 4.95$$

4·95 ..... [2]

(between 4·4 and 5·6 is ok)

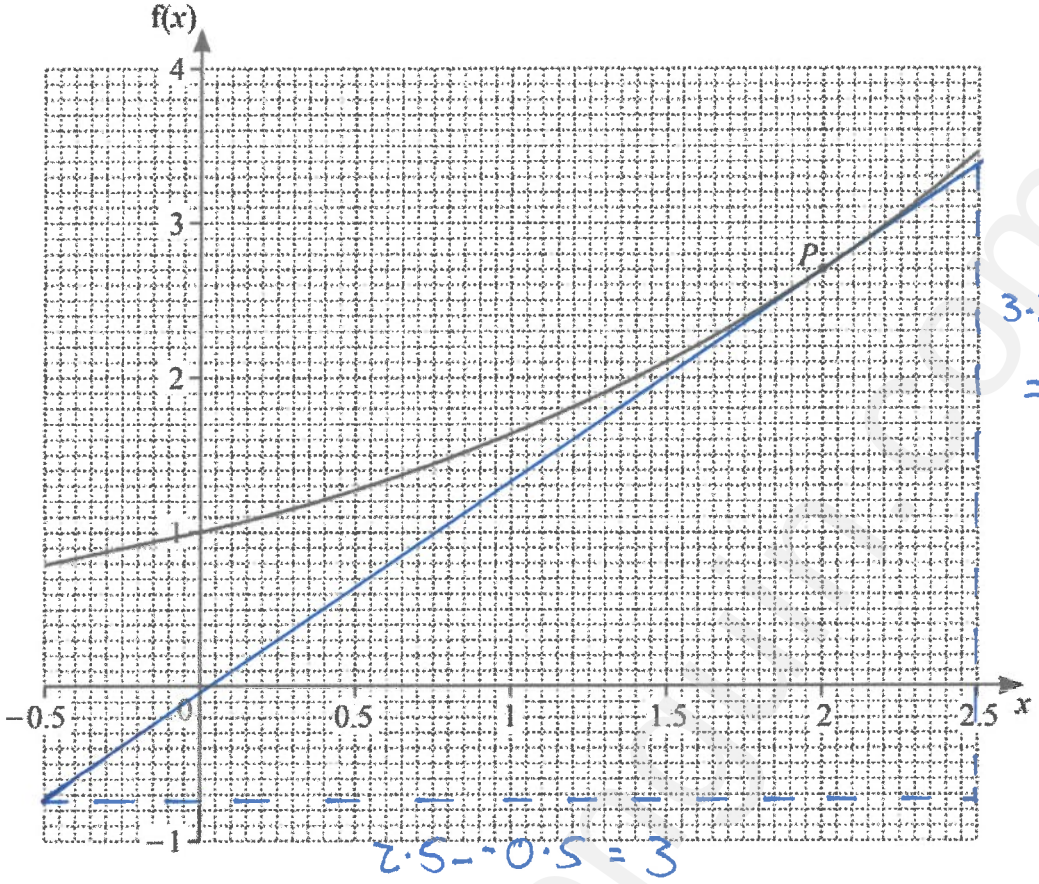
(iii) Write down the equation of your tangent in the form $y = mx + c$.

Crosses y-axis at −2, so $y = 4.95x - 2$

$y =$ 4·95x − 2 ..... [2]

(between −1·8 and −2·2)

(b)



The diagram shows the graph of another function.

By drawing a suitable tangent, find an estimate for the gradient of the function at the point P.

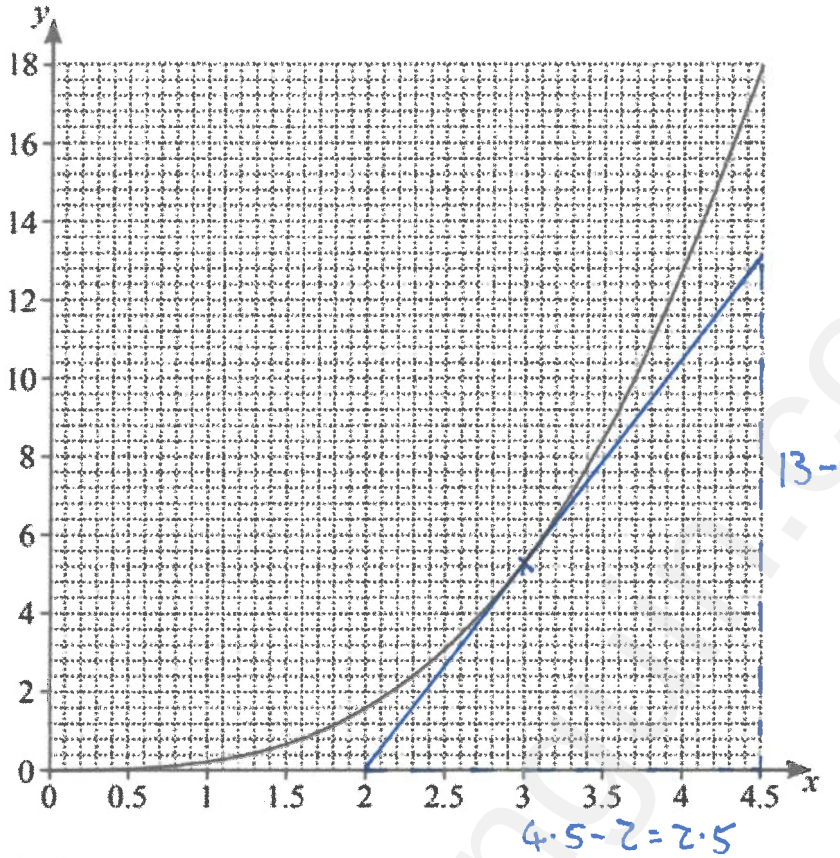
$$\text{gradient} = \frac{\text{change in } y}{\text{change in } x}$$

$$= \frac{4 \cdot 1}{3} = 1 \cdot 37$$

1·37 [3]

between 1·3 and 1·4

18



The graph of $y = f(x)$ is drawn on the grid.

(a) Draw the tangent to the graph at the point $x = 3$. [1]

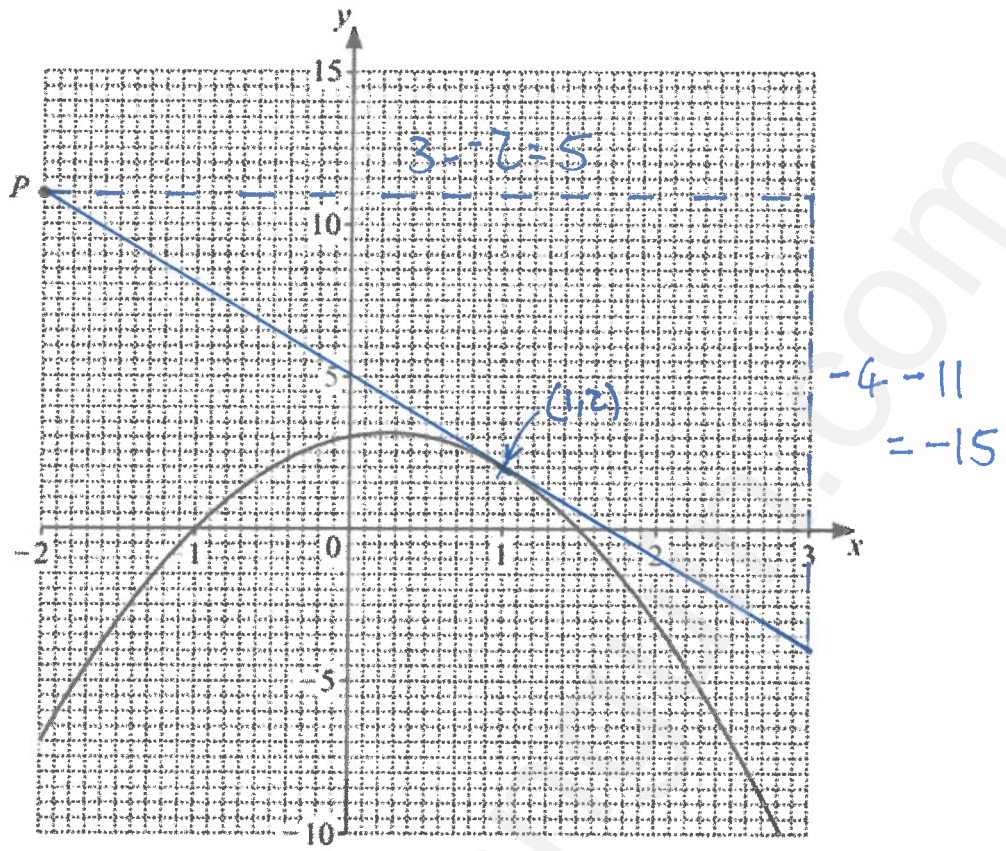
(b) Use your tangent to find an estimate for the gradient of the curve at the point $x = 3$.

gradient $= \frac{13}{2.5} = 5.2$

5.2 ..... [2]

between 4.8 and 5.8

11 The diagram shows the graph of $y = f(x)$ and the point $P(-2, 11)$.



The tangent from P touches the graph of $y = f(x)$ at the point (a, b).
The values of a and b are integers.

(a) By drawing this tangent, find the value of a and the value of b.

$a =$ 1 , $b =$ 2 [2]

(b) Find the equation of the tangent.
Give your answer in the form $y = mx + c$.

gradient $= \frac{-15}{5} = -3$

Sub. (1,2):

$y = -3x + C$

$2 = -3(1) + C$

$2 = -3 + C$

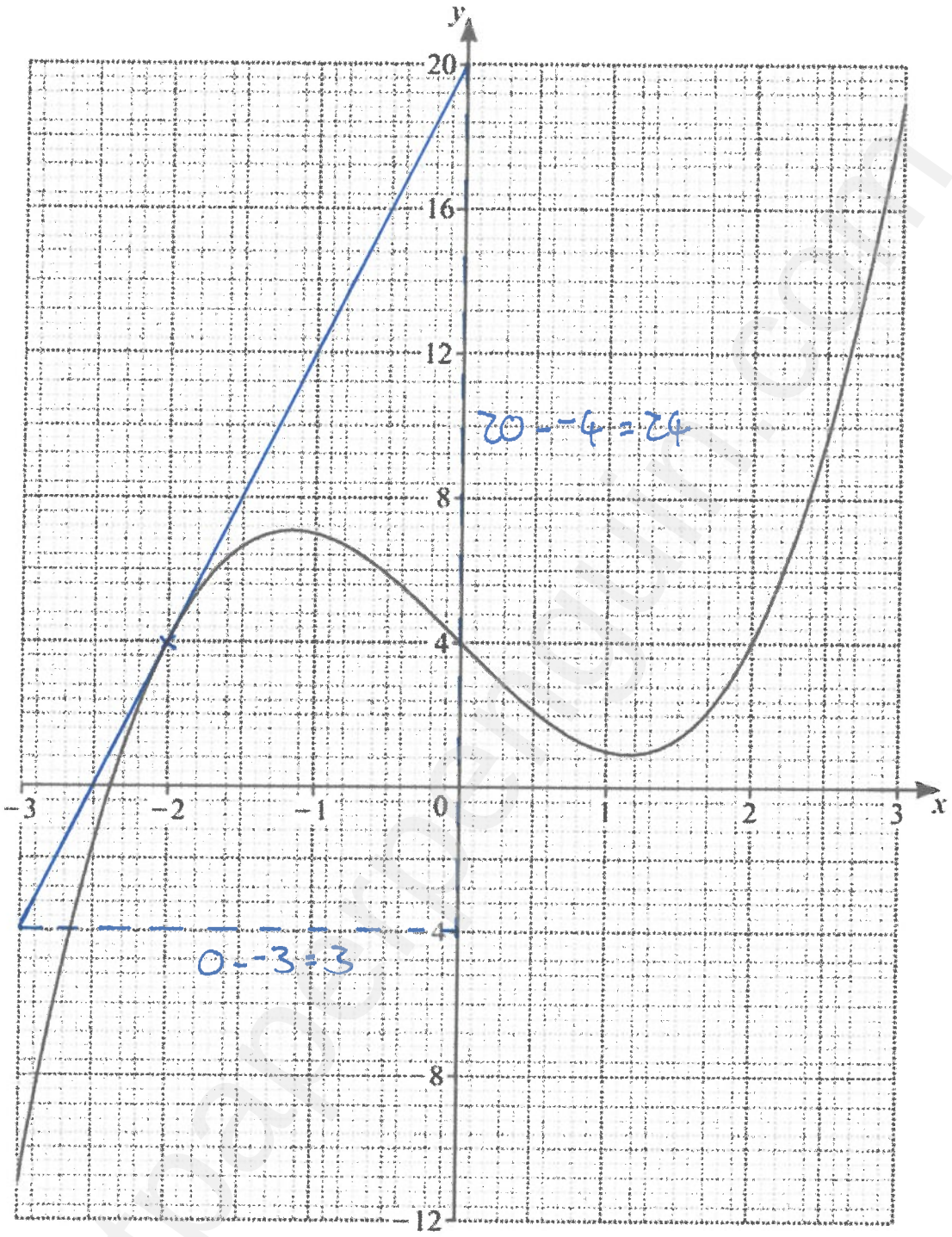
$+3 \quad +3$

$5 = C$

$y = -3x + 5$

$y =$ $-3x + 5$ [3]

5 **(a)** The diagram shows the graph of $y = f(x)$ for $-3 \leqslant x \leqslant 3$.



(ii) By drawing a suitable tangent, find an estimate of the gradient of the graph at the point $(-2, 4)$.

gradient = $\frac{24}{3} = 8$

8 [3]

between 6 and 10