

12.4) Differentiating quadratics

Worked example

Find the gradient of the curve:

$$y = x^2 + 3x + 2 \text{ at } (4, 30)$$

$$y = 2x^3 - x + 5 \text{ at } (-1, 4)$$

Your turn

Find the gradient of the curve:

$$y = 3x^2 - 2x + 1 \text{ at } (-2, 17)$$

-14

Worked example

Find the coordinates of the point(s) where the gradient is 4:

$$y = x^2 - 8x + 3$$

$$y = 5x^2 - x + 7$$

Your turn

Find the coordinates of the point(s) where the gradient is 3:

$$y = 3x^2 - 9x + 7$$

$$(2, 1)$$

Worked example

Let $f(x) = 8x^2 - 4x - 3$

- Find the gradient of $y = f(x)$ at the point $\left(\frac{1}{2}, 0\right)$
- Find the coordinates of the point on the graph of $y = f(x)$ where the gradient is 44.
- Find the gradient of $y = f(x)$ at the points where the curve meets the line $y = 12x + 21$.

Your turn

Let $f(x) = 4x^2 - 8x + 3$

- Find the gradient of $y = f(x)$ at the point $\left(\frac{1}{2}, 0\right)$
- Find the coordinates of the point on the graph of $y = f(x)$ where the gradient is 8.
- Find the gradient of $y = f(x)$ at the points where the curve meets the line $y = 4x - 5$.

a) -4

b) $(2, 3)$

c) At $(1, -1)$ gradient = 0

At $(2, 3)$ gradient = 8