

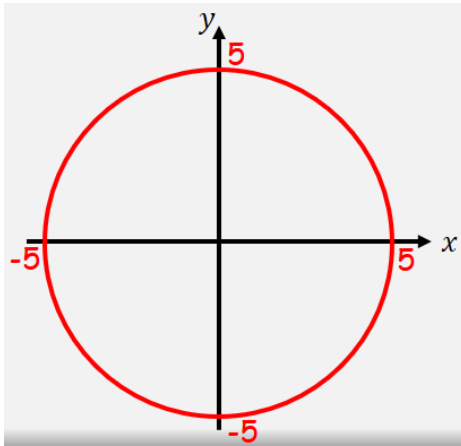
## 9H Implicit Differentiation

1. Differentiate the following equation implicitly:

$$y^3 = 3x^2$$

2. Below is a sketch of the circle with equation  $x^2 + y^2 = 25$ ,  $-5 \leq x \leq 5$ ,  $-5 \leq y \leq 5$ .

Find the gradient of the curve where  $x = 4$



3. Find  $\frac{dy}{dx}$  in terms of  $x$  and  $y$  when:

$$x^3 + x + y^3 + 3y = 6$$

4. Given that  $4xy^2 + \frac{6x^2}{y} = 10$ , find the value of  $\frac{dy}{dx}$  at the point (1,1)

5. Find the value of  $\frac{dy}{dx}$  at the point (1,1), when:

$$e^{2x} \ln y = x + y + 2$$

