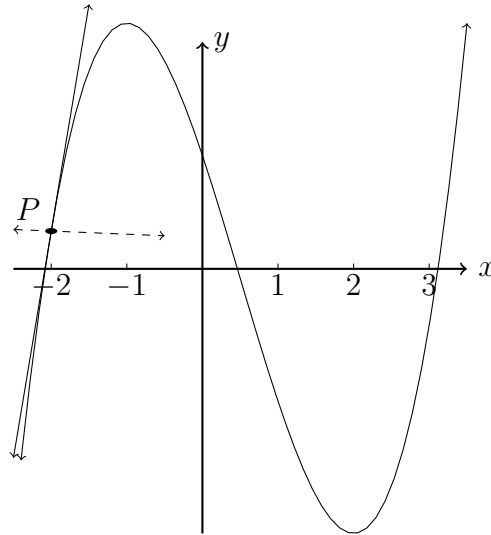


### 6.8 Do Now: Tangents, systems of equations, frequency tables

#### Calculator practice G

1. A cubic function  $f(x) = x^3 - \frac{3}{2}x^2 - 6x + 3$  is shown on the axes below.



A tangent to the function at  $x = -2$  is drawn with the point of tangency  $P$ .

- Write down the derivative of the function,  $f'(x)$ . [2]
- Show that the gradient of the tangent line is 12. [1]
- Find the equation of the tangent line. [2]
- Write down the slope of the perpendicular to the tangent line (the “normal”) [1]
- Find the  $x$  values of
  - the local minimum and
  - the local maximum of  $f$ . [2]

**Working:**

**Answers:**

(a) .....

(c) .....

(d) .....

(e)(i) .....

(ii) .....

2. The function  $\cos x$  equals  $\frac{1}{2}$  twice in each period. Set your calculator for radians, and find the solutions for the system ( $x$  such that  $f(x) = g(x)$ ) over the domain  $0 \leq x \leq 2\pi$ . Sketch the graph to show working.

$$f(x) = \cos x$$

$$g(x) = \frac{1}{2}$$

[2]

**Working:**

**Answers:**

(a) .....

(b) .....

3. Apply the law of cosines,  $c^2 = a^2 + b^2 - 2ab \cos \theta$ .

(a)  $a = 17.3$ ,  $b = 11.6$ ,  $\theta = 48^\circ$ . Find the third side length,  $c$ . [3]

(b)  $a = 10.4$ ,  $b = 13.1$ ,  $c = 9.1$ . Find  $\hat{C}$  (the angle opposite side  $c$ ). [3]

**Working:**

**Answers:**

(a) .....

(b) .....