

EXERCISE 6C p 89

4bdf, 5bdf, 6bdf, 8, 10, 12

$$4a \quad f(x) = 2x^2$$

$$f'(x) = 4x = 3$$

$$x = \frac{3}{4}$$

$$c \quad f(x) = 2 + 3x + x^2$$

$$f'(x) = 3 + 2x = 0$$

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

$$e. \quad f(x) = x^2 - 3x + 2$$

$$f'(x) = 2x - 3 = 0$$

$$2x = 3$$

$$x = \frac{3}{2}$$

$$b \quad f(x) = x - 2x^2$$

$$f'(x) = 1 - 4x = -1$$

$$2 = 4x$$

$$x = \frac{1}{2}$$

$$d \quad f(x) = x^2 + 4x - 1$$

$$f'(x) = 2x + 4 = 2$$

$$2x = -2$$

$$x = -1$$

$$f \quad f(x) = 6x^2 + 4x$$

$$f'(x) = 12x + 4 = 10$$

$$x = \frac{1}{2}$$

$$5b \quad y = 2x^2 - x, \quad x = 0, \quad y = 0$$

$$m = y' = 4x - 1 = -1$$

$$y = -x$$

$$6b \quad y = 3x^2 - 2x - 1, \quad x = 1, \quad y = 0$$

$$m = y' = 6x - 2 = 4, \quad m_n = -\frac{1}{4}$$

$$y = -\frac{1}{4}(x - 1)$$

$$y = -\frac{1}{4}x + \frac{1}{4}$$

$$d \quad y = 1 - x^2, \quad x = -3, \quad y = -8$$

$$m = -2x = 6$$

$$y + 8 = 6(x + 3)$$

$$y = 6x + 10$$

$$d \quad y = 1 - x^2, \quad x = 0, \quad y = 1$$

$$m = y' = -2x = 0, \quad m_n = \frac{1}{0}$$

$$x = 0$$

$$f. \quad y = (x-1)^2 = x^2 - 2x + 1, \quad x = 1, \quad y = 0$$

$$m = y' = 2x - 2 = 0$$

$$y = 0$$

$$f. \quad y = (2x-1)^2, \quad x = \frac{1}{2}, \quad y = 0$$

$$m = y' = 4(2x-1) = 8x - 4 = 0, \quad m_n = \frac{1}{0}$$

$$x = \frac{1}{2}$$

$$7 \quad // \quad y = x \rightarrow m = 1$$

$$y = x^2$$

$$m = 2x = 1$$

$$x = \frac{1}{2}, \quad y = \frac{1}{4}$$

$$y - \frac{1}{4} = x - \frac{1}{2}$$

$$y = x - \frac{1}{4}$$

$$8 \quad // \quad x \text{ axis} \quad m = 0$$

$$y = x^2$$

$$m = 2x = 0$$

$$x = 0, \quad y = 0 \quad (0, 0)$$

$$y = 0$$

$$9 \quad y = x^2 - 2x$$

$$\perp \text{ to } 2y = x - 1$$

$$y = \frac{1}{2}x - \frac{1}{2}$$

$$m = \frac{1}{2} \rightarrow m_{\perp} = -2$$

$$y' = 2x - 2 = -2$$

$$2x = 0$$

$$x = 0, y = 0 \quad (0,0)$$

$$y = -2x$$

$$10. \quad y = 3x^2 - 2x - 1$$

$$m_t = y' = 6x - 2$$

$$\parallel \text{ to } y = x - 3$$

$$m_n = 1, \quad m_t = -1$$

$$6x - 2 = -1$$

$$6x = 1$$

$$x = \frac{1}{6}, y = 3\left(\frac{1}{6}\right)^2 - 2\left(\frac{1}{6}\right) - 1$$

$$= \frac{3}{36} - \frac{1}{3} - 1 = \frac{1}{12} - \frac{4}{12} - \frac{12}{12} = -\frac{15}{12} = -\frac{5}{4}$$

$$\left(\frac{1}{6}, -\frac{5}{4}\right) \quad m_n = 1$$

$$y + \frac{5}{4} = x - \frac{1}{6}$$

$$12y + 15 = 12x - 2$$

$$12x - 12y = 17$$

$$11 \quad y = (x-1)^2 = x^2 - 2x + 1$$

$$m_t = y' = 2x - 2$$

$$m_n \parallel y \text{ axis} \Rightarrow m_n = \frac{1}{0}$$

$$m_t = 0 = 2x - 2$$

$$2x = 2, \quad x = 1, \quad y = 1 - 2 + 1 = 0$$

$$(1,0)$$

$$\underline{\underline{\text{line } x = 1}}$$

$$12 \quad y = 2x^2 + 3x + 4$$

$$m_t = y' = 4x + 3$$

$$m_n \perp y = 7x - 5$$

$$m_n \perp m = 7 = m_t = 4x + 3$$

$$m_n = -\frac{1}{7} \quad 7 - 3 = 4x$$

$$x = 1, \quad y = 9$$

$$y - 9 = -\frac{1}{7}(x - 1)$$

$$y = -\frac{1}{7}x + \frac{64}{7}$$