

SELF-EXERCISE 14 (CHAPTER 7)

1(a) $(x_1, y_1) = (2, 1)$ $(x_2, y_2) = (4, 5)$

$$\frac{y_2 - y_1}{x_2 - x_1}$$

$$= \frac{5 - 1}{4 - 2}$$

$$= \frac{4}{2}$$

$$= 2$$

(b) $(x_1, y_1) = (-1, 0)$ $(x_2, y_2) = (3, -5)$

$$\frac{y_2 - y_1}{x_2 - x_1}$$

$$= \frac{-5 - 0}{3 - (-1)}$$

$$= \frac{-5}{4}$$

$$= -\frac{5}{4}$$

2(a) $y = 3x + 4$; $y = 3x + 7$

$$y = 3x + 4$$

$$y = 3x + 7$$

* Parallel

$$m_1 = m_2$$

$$y = 3x + 4$$

$$y = mx + c$$

$$m_1 = 3$$

$$m_1 = m_2$$

$$y = 3x + 7$$

$$y = mx + c$$

$$m_2 = 3$$

(b) $y = -4x + 1$; $4y = x + 3$

$$y = -4x + 1$$

$$4y = x + 3$$

* Perpendicular

$$y = -4x + 1$$

$$y = mx + c$$

$$m_1 = -4$$

$$4y = x + 3$$

$$y = mx + c$$

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

$$y = \frac{1}{4}x + \frac{3}{4}$$

$$m_2 = \frac{1}{4}$$

$$m_1 \cdot m_2 = -4 \left(\frac{1}{4} \right)$$

$$= -1$$

(c) $y = 2x - 5$; $y = 5x - 5$

$$y = 2x - 5$$

$$y = 5x - 5$$

* Neither ✓

$$y = 2x - 5$$

$$y = mx + c$$

$$m_1 = 2$$

$$m_1 \cdot m_2 = 2$$

$$\cancel{x} \cdot m_2 = \cancel{x}$$

$$\cancel{x} \quad \cancel{x}$$

$$m_2 = 1$$

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$$y = 5x - 5$$

$$y = mx + c$$

$$m_2 = 5$$

$$m_1 \cdot m_2 = 5$$

$$\cancel{x} - m_2 \quad \cancel{x}$$

$$\cancel{x} \quad \cancel{x}$$

$$m_2 = 1$$

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3(a) $y = 3x + 6$; $(4, 7)$

$$y = 3x + 6 \quad \begin{matrix} x & y \\ 4 & 7 \end{matrix}$$

$$y = mx + c$$

$$m_1 = 3$$

#

$$y = mx + c$$

$$y = 3x + \cancel{6} c$$

$$7 = 3(4) + c$$

$$c = 7$$

$$\therefore y = 3x + 7$$

$$c = 7 - 12 = -5$$

$$c = -5$$

(b) $y = x - 4$; $(-2, 3)$

$$y = x - 4 \quad \begin{matrix} x & y \\ -2 & 3 \end{matrix}$$

$$y = mx + c$$

$$m_1 = 1$$

#

$$y = x + c$$

$$3 = -2 + c$$

$$c = \cancel{5} \quad \cancel{5}$$

$$\therefore y = \cancel{1} x + \cancel{5}$$

$$y + 2x = 4 ; (-1, 2)$$

$$y + 2x = 4 \quad (x, y)$$

$$y = mx + c$$

$$y = -2x + 4$$

$$m_1 = -2$$

$$y = -2x + c \quad (x, y)$$

$$2 = -2(-1) + c$$

$$2 = 2 + c$$

$$c = 0$$

$$\therefore y = -2x$$

$$4(a) \quad y = -4x - 2 ; (4, -4)$$

$$y = -4x - 2 \quad (x, y)$$

$$y = mx + c$$

$$m_1 = -4$$

$$m_1 - m_2 = -1$$

$$(-4) - m_2 = -1$$

$$m_2 = \frac{1}{4}$$

$$y = \frac{1}{4}x + c \quad (x, y)$$

$$-4 = \frac{1}{4}(4) + c$$

$$-4 - 1 = c$$

$$c = -5$$

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

$$(b) \quad y = 2x - 3 ; (-5, 3)$$

$$y = 2x - 3 \quad (x, y)$$

$$y = mx + c$$

$$m_1 = 2$$

$$m_1 - m_2 = -1$$

$$2 - m_2 = -1$$

$$m_2 = \frac{1}{2}$$

$$y = \frac{1}{2}x + c \quad (x, y)$$

$$3 = \frac{1}{2}(-5) + c$$

$$3 - 1 = c \quad c = 2$$

$$\therefore y = \frac{1}{2}x + 2$$

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

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

$$3 = -\frac{1}{2}(-5) + c$$

$$3 = \frac{5}{2} + c$$

$$3 - \frac{5}{2} = c$$

$$\frac{6-5}{2} = c$$

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

(c) $y = -5x + 1$; $(2, -1)$

$$y = -5x + 1 \quad (2, -1)$$

$$y = mx + c$$

$$m_1 = -5$$

$$m_1 - m_2 = -1$$

$$\frac{-5 - m_2}{-5} = \frac{-1}{-5}$$

$$m_2 = \frac{1}{5}^*$$

$$y = \frac{1}{5}x + c \quad (2, -1)$$

$$-1 = \frac{1}{5}(2) + c$$

$$-1 - \frac{2}{5} = c, \quad c = -\frac{7}{5}$$

$$\therefore y = \frac{1}{5}x - \frac{7}{5}$$

$$-1 - \frac{2}{5} = -\frac{7}{5}$$

$$y = \frac{1}{5}x - \frac{7}{5}$$

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