

Chapter Review

Section 6.1

1. Find the slope and y-intercept.

a) $2x - 5y = 7$
 $-5y = -2x + 7$
 $\div -5 \quad \div -5 \quad \div -5$
 $y = \frac{2}{5}x - \frac{7}{5}$

slope $\frac{2}{5}$
 y-intercept $-\frac{7}{5}$

b) $5x + y = -2$
 $-5x \quad -5x$
 $y = -5x - 2$

slope -5
 y-intercept -2

2. Write the following standard form equations in slope-intercept form.

a) $6x - y = 3$
 $-6x \quad -6x$
 $-y = -6x + 3$
 $\div -1 \quad \div -1 \quad \div -1$
 $y = 6x - 3$

$y = 6x - 3$
 General

b) $2x + 5y = 7$
 $-2x \quad -2x$
 $5y = -2x + 7$
 $\div 5 \quad \div 5 \quad \div 5$

$y = -\frac{2}{5}x + \frac{7}{5}$

3. Write the slope-intercept equations in standard form.

a) $(y = -\frac{2}{3}x + 4) \times 3$
 $3y = -2x + 12$
 $+2x - 12 \quad +2x - 12$

$2x + 3y - 12 = 0$

b) $(y = -3x + \frac{2}{5}) \times 5$
 $5y = -15x + 2$
 $+15x - 2 \quad +15x - 2$

$15x + 5y - 2 = 0$

4. Write the following point-slope equations in slope-intercept form.

a) $y + 1 = -\frac{2}{3}(x - 4)$
 $(y + 1 = -\frac{2}{3}x + \frac{8}{3}) \times 3$
 $3y + 3 = -2x + 8$
 $-3 \quad -3 \quad \div 3 \quad \div 3 \quad \div 3$

$y = -\frac{2}{3}x + \frac{5}{3}$
 General

b) $y - \frac{2}{3} = -4(x + \frac{1}{2})$
 $y - \frac{2}{3} = -4x - 2$
 $+\frac{2}{3} \quad +\frac{2}{3}$

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

5. Write the following point-slope equations in standard form.

a) $y + 1 = -\frac{2}{3}(x - 4)$
 $(y + 1 = -\frac{2}{3}x + \frac{8}{3}) \times 3$
 $3y + 3 = -2x + 8$
 $+2x - 8 \quad +2x - 8$

$2x + 3y - 5 = 0$

b) $y - \frac{2}{3} = -4(x + \frac{1}{2})$
 $(y - \frac{2}{3} = -4x - 2) \times 3$
 $3y - 2 = -12x - 6$
 $+12x + 6 \quad +12x + 6$

$12x + 3y + 4 = 0$

6. Write the equation of each line in standard form.

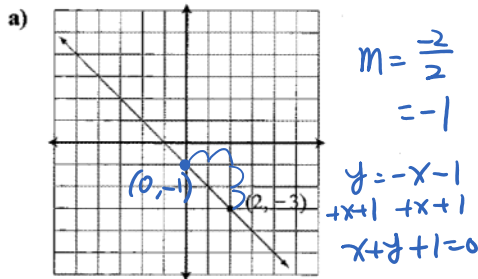
a) $(0, -3), m = -4$
 $y - \text{int} = -3 = b$
 $y = -4x - 3$
 $+4x + 3 \quad +4x + 3$

$4x + y + 3 = 0$

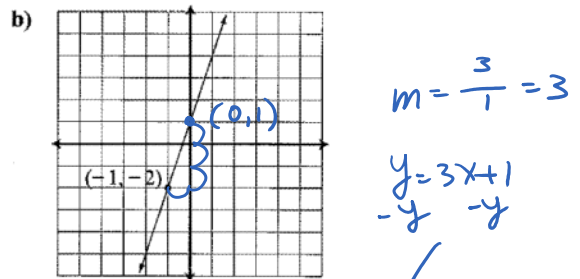
b) $(2, 0), m = -\frac{1}{3}$
 $y - 0 = -\frac{1}{3}(x - 2)$
 $(y = -\frac{1}{3}x + \frac{2}{3}) \times 3$
 $3y = -x + 2$
 $+x - 2 \quad +x - 2$

$x + 3y - 2 = 0$

7. Determine the equation of each equation in: ^{General} standard form, slope-intercept form and point-slope form.



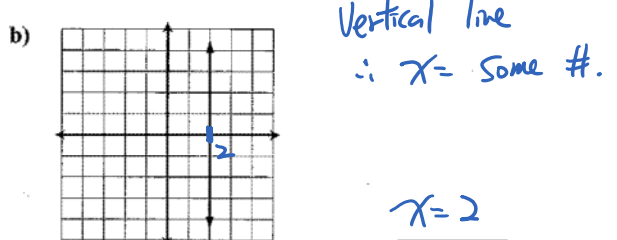
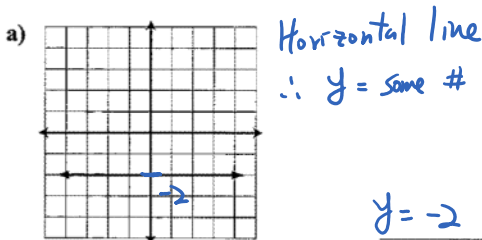
General ~~standard~~ form $x+y+1=0$
 slope-intercept form $y=-x-1$
 point-slope form $y+3=-1(x-2)$



General ~~standard~~ form $3x-y+1=0$
 slope-intercept form $y=3x+1$
 point-slope form $y+2=3(x+1)$

Section 6.2

8. Determine the equation of the following graphs.



9. Write the equation of the line with the given characteristics.

- a) vertical, passes through $(-2, 5)$ $x = -2$ b) horizontal, passes through $(-2, 5)$ $y = 5$

10. For each pair of equations, determine whether the lines are parallel, perpendicular or neither parallel nor perpendicular.

a) $3x + 2y = 7$ ①
 $4x + 6y = 2$ ②

$2y = -3x + 7$
 $y = \frac{-3}{2}x + \frac{7}{2}$
 $m_1 = \frac{-3}{2}$

$6y = -4x + 2$
 $y = \frac{-2}{3}x + \frac{1}{3}$
 $m_2 = \frac{-2}{3}$

Neither

b) $5x - 2y = 4$ ①
 $4x + 10y = 3$ ②

$-2y = -5x + 4$
 $y = \frac{5}{2}x - 2$
 $m_1 = \frac{5}{2}$

$10y = -4x + 3$
 $y = \frac{-2}{5}x + \frac{3}{10}$
 $m_2 = \frac{-2}{5}$

⊥

c) $y = 2x - 3$ ①
 $2x + y = -3$ ②

$m_1 = 2$
 $y = -2x - 3$
 $m_2 = -2$

Neither

d) $3x - y = 2$ ①
 $6x - 2y = 2$ ②

$-y = -3x + 2$
 $y = 3x - 2$
 $m_1 = 3$

$-2y = -6x + 2$
 $y = 3x - 1$
 $m_2 = 3$

||

11. Write the equation of the line passing through the given set of points in standard form.

a) $(-3, 1)$ and $(-4, -6)$

$m = \frac{-6-1}{-4-(-3)} = \frac{-7}{-1} = 7$
 $y - 1 = 7(x - (-3))$
 $y - 1 = 7(x + 3)$
 $y - 1 = 7x + 21$
 $-y + 1 = -7x - 21$

$7x - y + 22 = 0$

b) $(-2, -3)$ and $(-5, -1)$

$m = \frac{-1-(-3)}{-5-(-2)} = \frac{2}{-3} = \frac{-2}{3}$
 $y - (-3) = \frac{-2}{3}(x - (-2))$
 $y + 3 = \frac{-2}{3}(x + 2)$
 $(y + 3) = \frac{-2}{3}x - \frac{4}{3}$
 $3(y + 3) = -2x - 4$
 $3y + 9 = -2x - 4$
 $2x + 3y + 13 = 0$

General

Section 6.3

12. Find the slopes of lines parallel and perpendicular to the following equations.

a) $3x - 4y = -6$

$-4y = -3x - 6$
 $\div -4$
 $y = \frac{3}{4}x + \frac{3}{2}$

$m_{||} = \frac{3}{4}$
 $m_{\perp} = \frac{-4}{3}$

b) $x = 3y + 2$

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

$m_{||} = \frac{1}{3}$
 $m_{\perp} = -3$

13. Find the equation of the line that passes through the given point and is parallel to the given line.

a) $P(-2, 4); 2x - 3y = 5$

$2x - 3y = 5$
 $-3y = -2x + 5$
 $\div -3$
 $y = \frac{2}{3}x - \frac{5}{3}$
 $m = \frac{2}{3}$

b) $P(4, -1); 4x + 7y = -2$

$7y = -4x - 2$
 $\div 7$
 $y = \frac{-4}{7}x - \frac{2}{7}$
 $m = \frac{-4}{7}$

14. Find the equation of the line that passes through the given point and is perpendicular to the given line.

a) $P(-2, 4); 2x - 3y = 5$

$\perp \therefore m = \frac{3}{2}$

b) $P(4, -1); 4x + 7y = -2$

$\perp \therefore m = \frac{7}{4}$

15. Determine the equation of a line, in ~~standard~~ ^{General} form which is parallel to the line and which goes through the given point.

a) $(5, 2)$

Handwritten work:
 $m = -\frac{1}{2}$
 $y - 2 = -\frac{1}{2}(x - 5)$
 $2y - 4 = -x + 5$
 $+x - 5 \quad +x - 5$
 $x + 2y - 9 = 0$

b) $(-3, 4)$

Handwritten work:
 $m = \frac{2}{3}$
 $y - 4 = \frac{2}{3}(x + 3)$
 $(y - 4 = \frac{2}{3}x + 2) \times 3$
 $3y - 12 = 2x + 6$
 $-3y + 12 \quad -3y + 12$
 $0 = 2x - 3y + 18$

16. Determine the equation of a line, in ~~standard~~ ^{General} form which is perpendicular to the line and which goes through the given point.

a) $(5, 2)$

Handwritten work:
 $m_{\perp} = \frac{2}{1} = 2$
 $y - 2 = 2(x - 5)$
 $y - 2 = 2x - 10$
 $-y + 2 \quad -y + 2$
 $0 = 2x - y - 8$

b) $(-3, 4)$

Handwritten work:
 $m_{\perp} = -\frac{3}{2}$
 $y - 4 = -\frac{3}{2}(x + 3)$
 $(y - 4 = -\frac{3}{2}x - \frac{9}{2}) \times 2$
 $2y - 8 = -3x - 9$
 $+3x + 9 \quad +3x + 9$
 $3x + 2y + 1 = 0$

17. The cost to print 1200 books is \$11 140, and the cost to print 2000 books is \$17 940. Assuming there is a linear relation between the costs and the number of books printed.

a) Find the cost equation.

Handwritten work:
 (n, c)
 $(1200, 11140), (2000, 17940)$
 $m = \frac{17940 - 11140}{2000 - 1200} = \frac{6800}{800} = \frac{17}{2}$
 $C - 11140 = \frac{17}{2}(n - 1200)$

c) Find the cost of 3000 books.

Handwritten work:
 $C = \frac{17}{2}(3000) + 940$
 $= 25500 + 940$
 $= \$26440$

b) Find the "set up" cost of printing the books.

Handwritten work:
 $\$940$
 $(C - 11140 = \frac{17}{2}n - 10200) \times 2$
 $2C - 22280 = 17n - 20400$
 $+22280 \quad +22280$
 $2C = 17n + 1880$
 $\div 2 \quad \div 2$
 $C = \frac{17}{2}n + 940$

d) How many books can be purchased for \$24 740.

Handwritten work:
 $24740 = \frac{17}{2}n + 940$
 $-940 \quad -940$
 $23800 = \frac{17}{2}n$
 $\div \frac{17}{2} \quad \div \frac{17}{2}$
 $n = 2800$ books