Name: *Key*

7.2 GENERAL FORM

1. Jasmine was asked to convert the equation $y=-\frac{3}{2}x + 4$ to general form. Her work is shown. Identify Jasmine's error by circling it, then, correct her work.

$y = -\frac{3}{2}x + \boxed{4}$ — error

$2y = -3x + 4$

$3x + 2y - 4 = 0$

Correct Answer

$2\left(y = -\frac{3x}{2} + 4 \right)$ ← she forgot to multiply $4 \times 2 = 8$

$2y = -3x + 8$

$+3x \quad -8 \qquad +3x$

$3x + 2y - 8 = 0$

2. Express each equation in general form, Ax+By+C = 0. Show all work!

a) $y = 7x-5$

$-7x+5 \quad -7x \quad +5$

$-1(-7x+y+5=0)$ $7x-y-5=0$

c) $y = \frac{3}{2}x + 4$

$2y = 3x + 8$
$ -3x \quad -8$
$-3x + 2y - 8 = 0$ $3x - 2y + 8 = 0$

e) $y = 0.25x - 0.3$

$20\left(y = \frac{1}{4}x - \frac{3}{10} \right)$ $20y = 5x - 6$
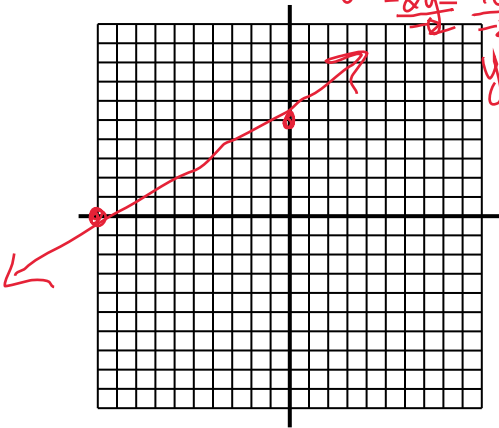$-5x + 20y + 6 = 0$
$5x - 20y - 6 = 0$

b) $y = -x + 8$

$+x - 8 \quad +x - 8$

$x + y - 8 = 0$

d) $y = -\frac{3}{5}x - 2$

$5y = -3x - 10$
$+3x + 10 \quad +3x + 10$

$3x + 5y + 10 = 0$

f) $y = -\frac{5}{2}x + \frac{1}{8}$

$8y = -20x + 1$

$20x + 8y - 1 = 0$

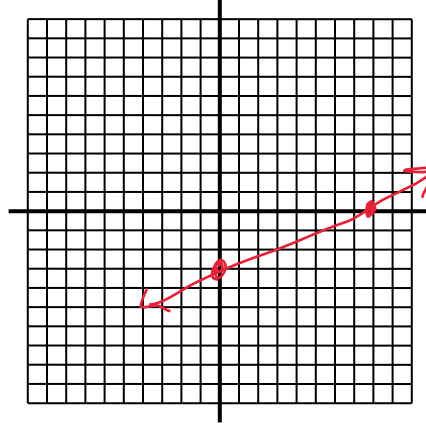3. Determine the intercepts of each line. Then, graph the line.

a) 2x+y-9=0

x-int y=0
$2x - 9 = 0$
$2x = 9$ x = 4.5

y-int x=0
y=9

b) 4x-y-8=0

x-int y=0 $\frac{4x}{4} = \frac{8}{4}$
x=2

y-int x=0
-y=8
y=-8

All solutions can be found on page 544 in the 7.2 General Form section.
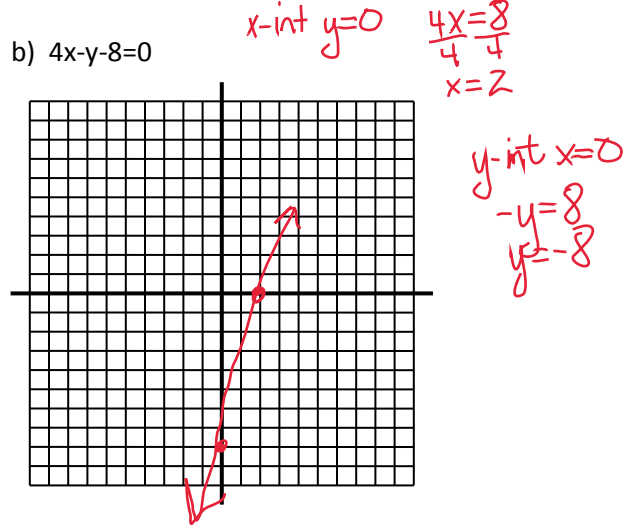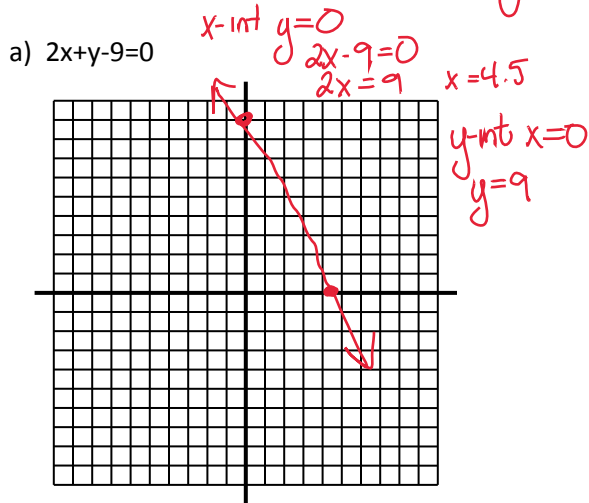
c) x – 2y + 10 = 0

x-int: y=0
X= -40

y-int x=0
$\frac{-2y}{-2} = \frac{-10}{-2}$
y=5

d) 3x – 8y – 24 = 0

x-int y=0
3x=24
x=8

y-int x=0
$\frac{-8y}{-8} = \frac{24}{-8}$
y=-3

e) 4x + 5y + 6 = 0

x-int, y=0
$\frac{4x}{4} = \frac{-6}{4}$
X= $\frac{-3}{2}$
X= -1.5

y-int, x=0
$\frac{5y}{5} = \frac{-6}{5}$
y= $\frac{-6}{5}$
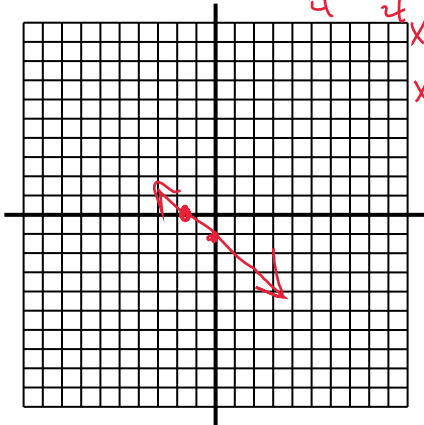
f) x = 4
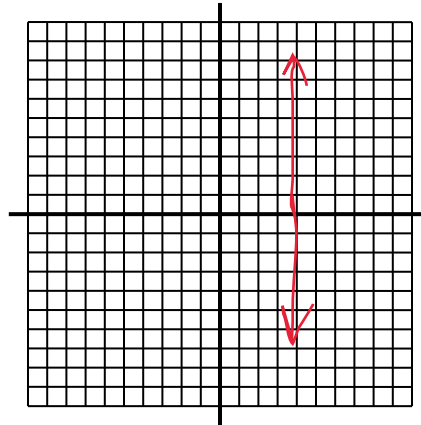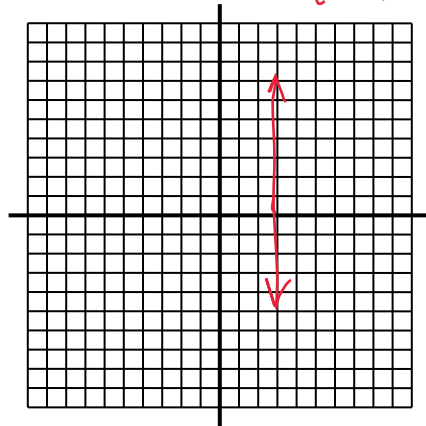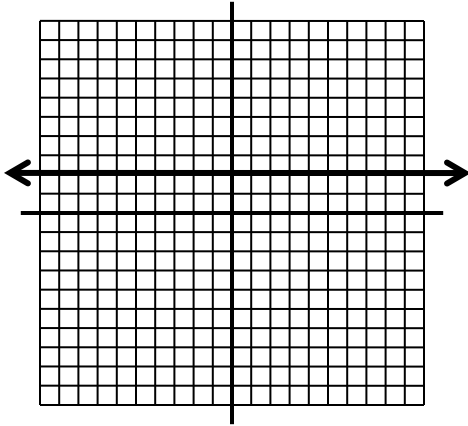
g) y = 0
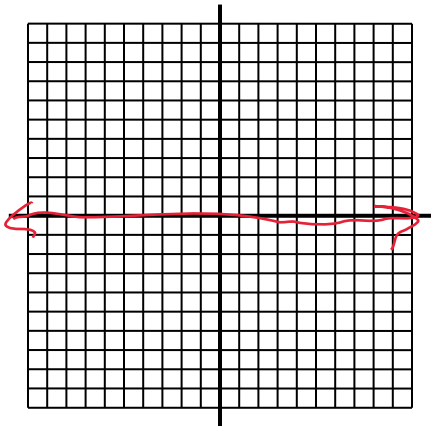
h) 4x-12 = 0

$\frac{4x}{4} = \frac{12}{4}$ x=3

All solutions can be found on page 544 in the 7.2 General Form section.

4. For each line, state the domain, range, intercepts, and slope. Then state the equation of each line, in general form.

a)

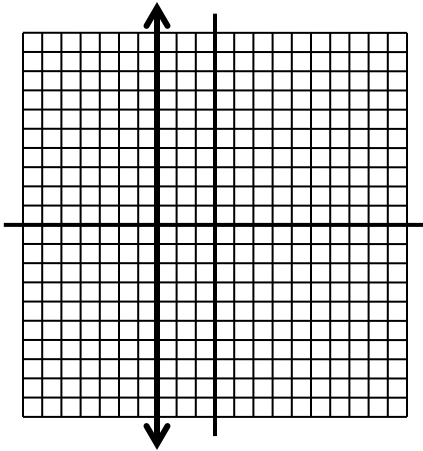Domain = $(-\infty, \infty)$ or $\{x \mid -8 < x < 8, x \in R\}$

Range = $\{2\}$

x-intercept = NA

y – intercept = 2

Slope = 0

b)

Domain = $\{3\}$

Range = $(-\infty, \infty)$ or $\{y \mid -8 < y < 8, y \in R\}$

x-intercept = 3

y – intercept = NA

Slope = undefined

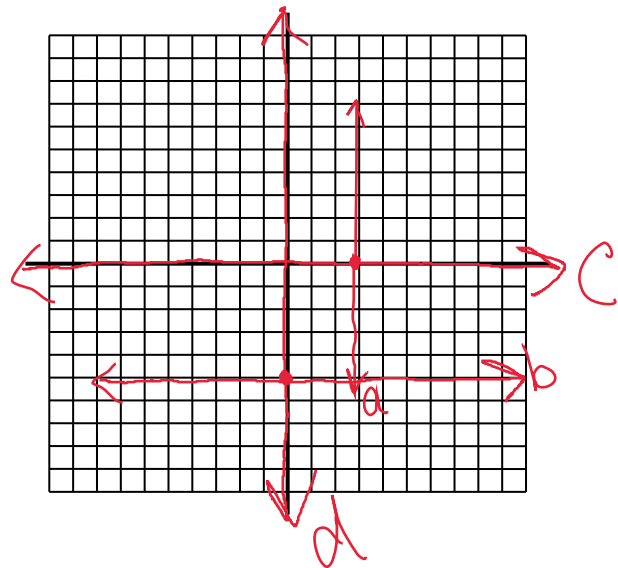5. Graph each line using the given intercepts. What is the equation of each line? Place all solutions on the same grid and label a,b,c,&d.

a) an x-intercept of 3 and no y – intercept $x = 3$

b) a y-intercept of -5 and no x-intercept

c) an infinite number of x-intercepts   along x axis

d) an infinite number of y intercepts   along y axis

All solutions can be found on page 544 in the 7.2 General Form section.

6. Match each equation with a line labelled in the figure.

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

b) $x = 4$ ④

c) $3x - 4y = 12$ ⑧ $-4y = -3x + 12$ $y = \frac{3}{4}x - 3$

d) $y - 4 = 0$ ⑤ $y = 4$

e) $3x - 4y + 12 = 0$ ③ $-4y = \frac{-3x - 12}{-4}$ $y = \frac{3}{4}x + 3$

f) $y = -4$ ⑥

g) $3x + 4y + 12 = 0$ ⑦ $4y = \frac{-3x - 12}{4}$ $y = -\frac{3}{4}x - 3$

h) $x + 4 = 0$ ① $x = -4$

7. Write an equation, in general form, for each line described.

a) A vertical line passing through the point (3,5) $x = 3$ $x - 3 = 0$

b) A horizontal line passing through the point (-2,6) $y = 6$ $y - 6 = 0$

c) The x-axis $y = 0$

d) The y-axis $x = 0$

8. Write an equation, in general form, of a line that does not have a y-intercept and passes through the point (3,6)

vertical line

$x = 3$ ⟨$x - 3 = 0$⟩

10. An airplane flies directly from Saskatoon, SK, to Vancouver, BC. The graph shows the relationship between the distance from Vancouver, d, in kilometers, and the flying time, t, in hours. SHOW WORK!

a) State the intercepts of the line segment.

? missing graph

What does each intercept represent?

b) State a suitable domain and range of the graph.

c) Determine the slope of the line. What does the slope represent?

All solutions can be found on page 544 in the 7.2 General Form section.

d) Write the equation of the line in general form.

e) For how many hours has the plane been flying when it
is 200km from Vancouver?

f) What is the distance from Vancouver when the plane
has been flying for 45minutes?

11. Luc swims as a part of an active and healthy lifestyle. The number of calories burned by a swimmer
of Luc's body weight is shown in the table.

Swimming Style	Calories Burned Per Minute
Backstroke	8
Butterfly	11

a) Write a linear equation to describe the number of minutes Luc would need to swim backstroke,
x, and the butterfly, y, to burn 440 calories.

$$8x + 11y = 440$$

b) What are the intercepts of the line? What does each intercept represent?

X-Int $8x = 440$ Y-Int $11y = 440$
$y = 0$ $\frac{8x}{8} = \frac{440}{8}$ $x = 0$ $\frac{11y}{11} = \frac{440}{11}$
          $x = 55\,min$ $y = 95\,min$

the intercepts represent the # of minutes for each swim style

c) Suppose Luc swims butterfly for 16 min. How long will he need to swim backstroke in order to
burn 440 calories in total? Show work.

$$8x + 11y = 440$$

$8x + 11(16) = 440$ $8x = 264$
$8x + 176 = 440$ $\frac{8x}{8} = \frac{264}{8}$
$-176 \quad -176$
                           $x = 33\,minutes$

12. Sanding trucks spread a mixture of sand and salt on roads to improve traction in winter. The density
of the salt is 1200 kg/m³. The density of the sand is 1800 kg/m³.

a) Write a linear equation to represent the volume, in cubic metres, of salt, x, and of sand, y in a mixture
with a mass of 10000kg.   Let x = volume of salt
                            y = volume of sand $1200x + 1800y = 10,000kg$

All solutions can be found on page 544 in the 7.2 General Form section.

b) For temperatures below -12°C, the volume of the sand in 10000kg of the mixture is 5.22 m³. What is the volume of salt in the mixture?

$$1200x + 1800(5.22) = 10,000$$
$$1200x + 9396 = 10,000$$
$$-9396 \quad -9396$$
$$\frac{1200x}{1200} = \frac{604}{1200}$$
$$x = 0.5m^3$$

c) By mass, what percent of the mixture is salt?

$$\left(1200 \frac{kg}{m^3}\right)\left(0.5m^3\right) = 600\,kg \qquad \frac{600}{10,000} = 6\% \text{ salt}$$

13. Advance tickets for a local concert sold for $8 each. Tickets at the door were $12 each. The revenue from ticket sales was $1120.

a) Write a linear equation relating the number of advance tickets, a, to the number of tickets sold at the door, d. Express your equation in general form.

$$8a + 12b = 1120$$
$$8a + 12b - 1120 = 0$$

b) Suppose twice as many advance tickets were sold as tickets at the door. How many of each type of ticket were sold?

$$8a + 12b - 1120 = 0$$
$$a = 2b$$

✳ 80 tickets in advance and 40 door

$$8(2b) + 12b - 1120 = 0$$
$$16b + 12b - 1120 = 0$$
$$28b - 1120 = 0$$
$$\frac{28b}{28} = \frac{1120}{28} \qquad b = 40$$

14. What is the value of the unknown parameter in each equation?

a. Ax + 5y – 6 = 0, passing through (-3,2)

$$A(-3) + 5 \cdot (2) - 6 = 0$$
$$-3A + 10 - 6 = 0$$
$$-3A + 4 = 0$$
$$\frac{-3A}{-3} = \frac{-4}{-3} \qquad A = \frac{4}{3}$$

b. 2x + By + 7 = 0, passing through (4, -5)

$$2(4) + B(-5) + 7 = 0 \qquad 8 + (-5)B + 7 = 0$$
$$\frac{-5B}{-5} = \frac{-15}{-5} \qquad B = 3$$

c. 4x – 3y + C = 0 , passing through (-2, -6)

$$4(-2) - 3(-6) + C = 0 \qquad -8 + 18 + C = 0$$
$$10 + C = 0 \qquad C = -10$$

16. The equation 6x + By +5 = 0 describes a line with a slope of $\frac{3}{2}$. What is the value of B?

$$-6x \quad -5$$
$$\frac{By}{B} = \frac{-6x - 5}{B}$$
$$y = -\frac{6x}{B} - \frac{5}{B}$$

$$B = 4$$

All solutions can be found on page 544 in the 7.2 General Form section.