1. Express each equation in the form $y = mx + b$

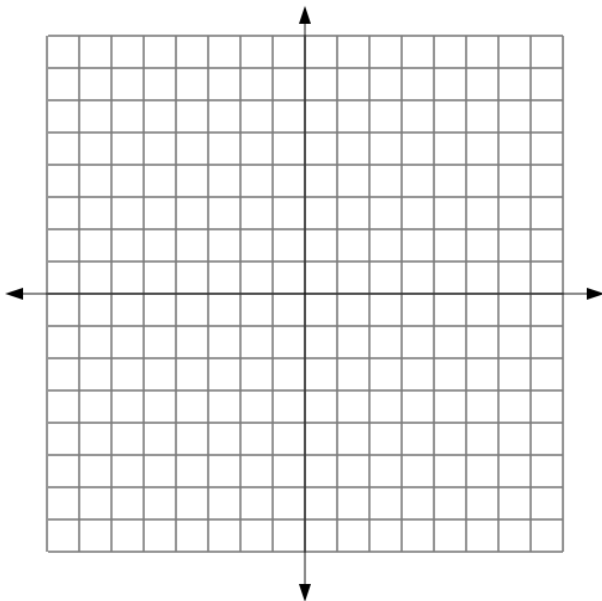a) $x + y - 3 = 0$

b) $2x + 3y + 6 = 0$

c) $x - 4y + 12 = 0$

d) $3x + 2y - 5 = 0$
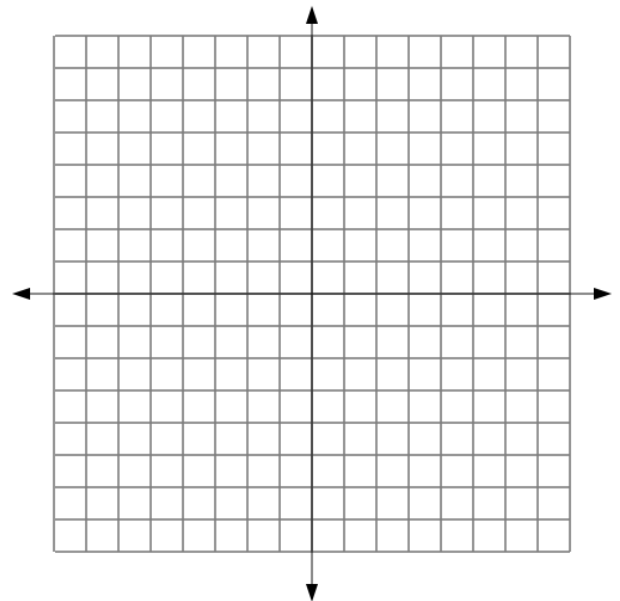
2. For each linear relation in question 1,

- Identify the slope and the y-intercept
- Use this information to graph the line
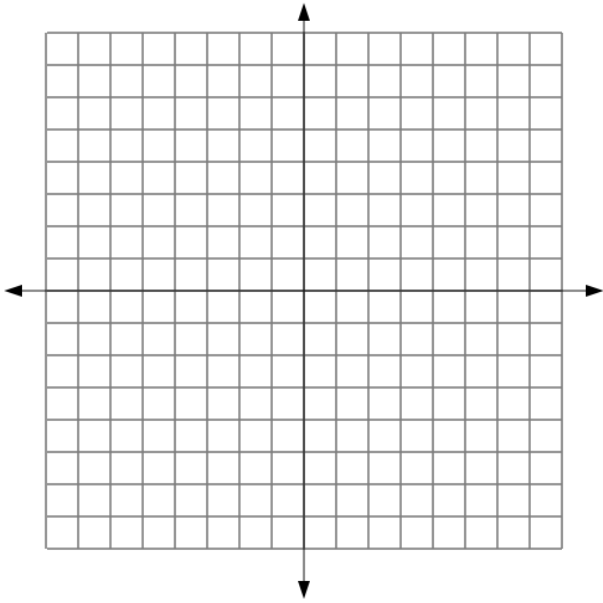
a)
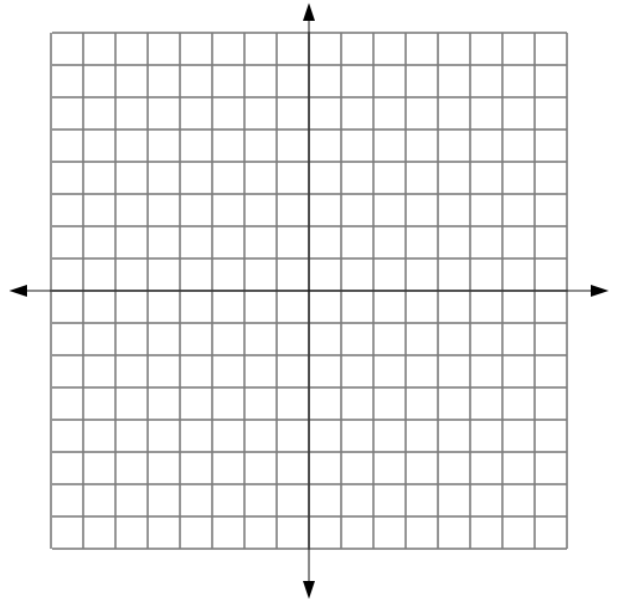
b)

c)   d)

3. Identify the slope and the y-intercept of each line.

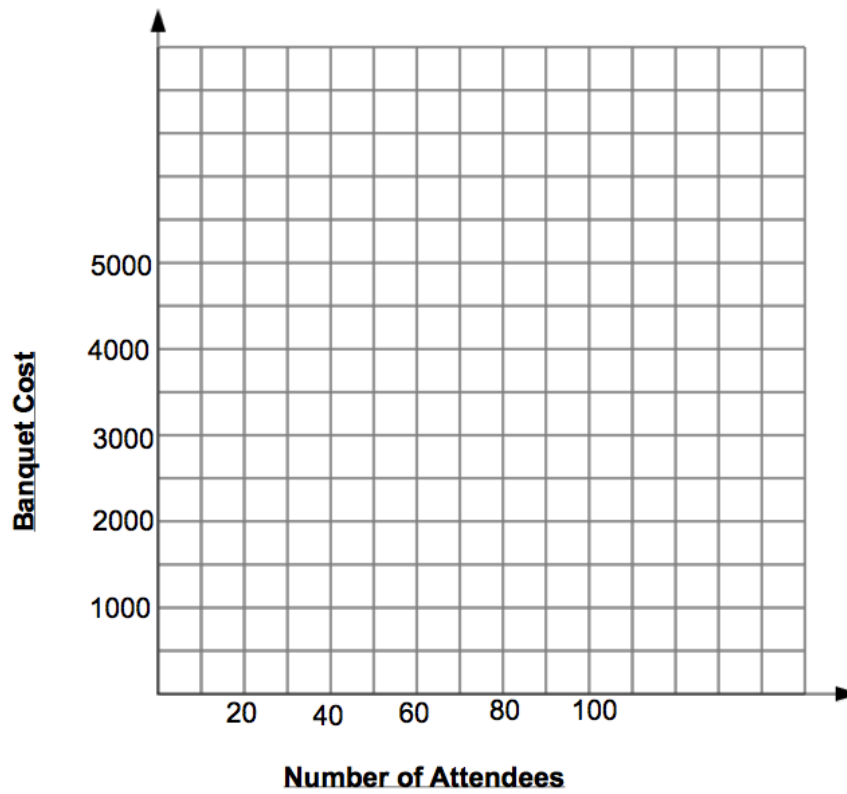a) $x + 3y - 3 = 0$ b) $2x - 5y + 8 = 0$

4. The Easy Event banquet hall charges according to the equation $40n - C + 250 = 0$

a) Express the equation in slope y-intercept form: $C = mn + b$

b) Identify the fixed and variable costs.

c) Illustrate the relation graphically

d) What is the rental cost if 100 people attend a soccer banquet?

5. There are a lot of factories in the Jean's home city. The equation $n - E + 15 = 0$ describes how much a worker might earn, E, in dollars per hour, according to the number of years experience, n. Find the hourly earnings of a beginning factory worker, and of a worker with 5 years experience.

6. The equation $9C - 5F + 160 = 0$ describes the relationship between temperature, C, in degrees Celsius, and temperature, F, in degrees Fahrenheit.

a) Express this equation in the form $C = mf + b$

b) Graph this relation
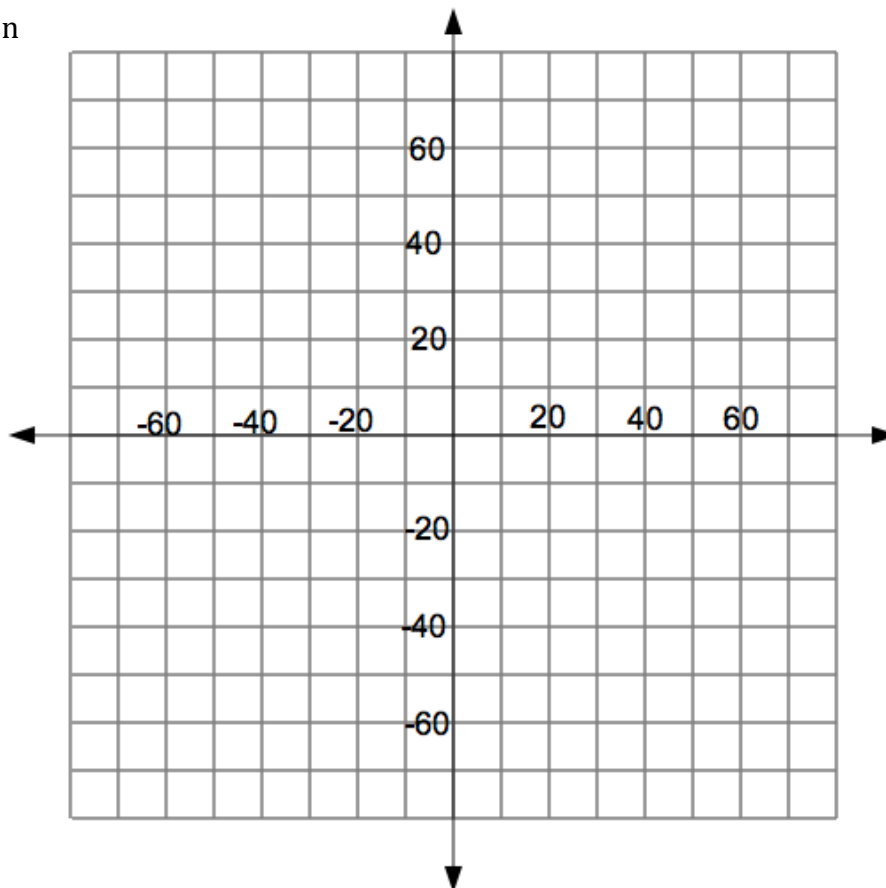
c) Identify the slope and the C-intercept and explain what they mean.

7. The Knights Banquet Hall uses the equation $25n - C + 1250 = 0$ to determine the cost for a hall rental. The Legions Banquet Hall uses the equation $30n + 995 - C = 0$ to determine the cost for their hall rental. In each case, C represents the cost, in dollars, which depends on n, the number of people attending.

a) Express each equation in slope y-intercept form: $C = mn + b$

b) Identify the fixed and variable costs for each hall.

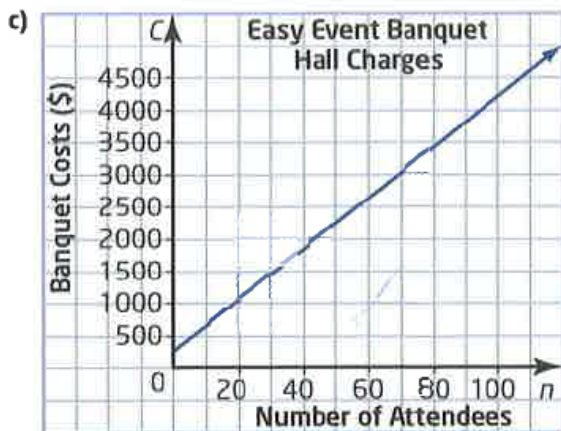c) What is the cost at each hall for a graduation banquet for 45 people?

8. [BONUS] You can change an equation from slope y-intercept form to standard form by rearranging terms in the equation. Rearrange each of the following equation into standard form. $Ax + By + c = 0$, and identify the coefficients A, B, and C. Hint: In standard form, the coefficient of the x-term is always positive and there are no fractions.

a) $y = -2x + 7$

b) $y = \frac{3}{4}x - 2$

Answers:

1. a) $y = -x + 3$ **b)** $y = -\dfrac{2}{3}x - 2$

c) $y = \dfrac{1}{4}x + 3$ **d)** $y = -\dfrac{3}{2}x + \dfrac{5}{2}$

2. a) slope -1; y-intercept 3; the graph is a line crossing the y-axis at 3 and the x-axis at 3.

b) slope $-\dfrac{2}{3}$; y-intercept -2; the graph is a line crossing the y-axis at -2 and the x-axis at -3.

c) slope $\dfrac{1}{4}$; y-intercept 3; the graph is a line crssing the y-axis at 3 and passing through $(4, 4)$.

d) slope $-\dfrac{3}{2}$; y-intercept $\dfrac{5}{2}$; the graph is a line crossing

the y-axis at $2\dfrac{1}{2}$ and passing through $(3, -2)$.

3. a) slope $-\dfrac{1}{3}$; y-intercept 1

b) slope $\dfrac{2}{5}$; y-intercept $\dfrac{8}{5}$

4. a) $C = 40n + 250$
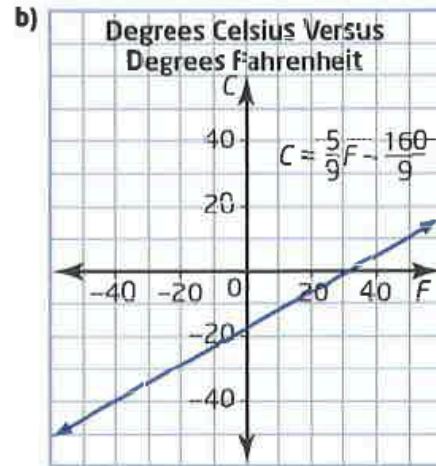**b)** fixed cost \$250; variable cost \$40 per person

c)

Easy Event Banquet Hall Charges

d) \$4250

5. \$15, \$20

6.

a) $C = \dfrac{5}{9}F - \dfrac{160}{9}$

b)

Degrees Celsius Versus Degrees Fahrenheit

$C = \dfrac{5}{9}F - \dfrac{160}{9}$

c) The slope is $\dfrac{5}{9}$ and the C-intercept is $-\dfrac{160}{9}$. The slope is a multiplication coefficient and the C-intercept is a constant. To change a Fahrenheit temperature to a Celsius temperature, multiply the Fahrenheit temperature by the slope and add the C-intercept.

7. a) $C = 25n + 1250$; $C = 30n + 995$
b) Knights: fixed = 1250, variable=25
Legions: fixed=995, variable=30
c) Knights=\$2375 ; Legions=\$2345

8. a) 2x+y-7=0; A=2, B=1, C=-7
b) 3x-4y-8=0; A=3, B=-4, C=-8