

Day 4 - Standard Form - Practice

Use the scenario below to answer questions 1-6.

The athletic department will raise money by charging admission to an upcoming football game. The price will be different for students and adults. Student tickets cost \$3 each and adult tickets cost \$5 each. The goal is to raise \$5000 from the sale of tickets to the game.

1. Define variables that represent the unknown quantities in the problem. Then write an equation that can be used to find the number of student and adult tickets if the goal is reached.

x : # of Student tickets

y : # of adult tickets

$$3x + 5y = 5000$$

2. Using the equation, calculate the x and y intercepts of the equations. Show all your work.

x -int ($y=0$)

$$3x + 5(0) = 5000$$

$$3x = 5000$$

$$x = 1666.6$$

1667 Student tickets

y -int ($x=0$)

$$3(0) + 5y = 5000$$

$$5y = 5000$$

$$y = 1000$$

1000 adult tickets

3. What do the intercepts mean in terms of the problem situation? Use complete sentences in your answer.

If 0 adults buy tickets, they will need to sell 1667 student tickets.

If 0 students buy tickets, they will need to sell 1000 adult tickets.

4. Assuming the athletic department met its goal of \$5000, find the number of student tickets sold if 600 adult tickets sold.

$$y = 600$$

$$3x + 5(600) = 5000$$

$$3x + 3000 = 5000$$

$$3x = 2000$$

$x = 667$ student tickets

5. Assuming the athletic department met its goal of \$5000, find the number of adult tickets sold if 400 student tickets sold.

$$x = 400$$

$$3(400) + 5y = 5000$$

$$1200 + 5y = 5000$$

$$5y = 3800$$

$y = 760$ adult tickets

6. Write the equation from Question 1 in slope intercept form.

$$3x + 5y = 5000$$

$$\begin{array}{r} -3x \\ \hline 5y = -3x + 5000 \end{array}$$

$$\frac{5y}{5} = \frac{-3x}{5} + \frac{5000}{5}$$

$$y = -\frac{3x}{5} + 1000$$

Directions: For the following scenarios, create an equation in standard form to represent the scenario. Define what your variables are representing.

7. In a supermarket, each orange costs \$3 and each apple costs \$2. You plan to spend exactly \$45.

Equation: $3x + 2y = 45$

Variables: x : # of oranges

y : # of apples

8. A company will lease office space in two buildings. The annual cost \$21.75 per square foot in the first building and \$17 per square foot in the second. The company has \$86,000 budgeted for rent.

Equation:

$$21.75x + 17y = 86,000$$

Variables:

x : # of square feet in 1st building

y : # of square feet in 2nd building

9. The costs of general admission and student tickets to a high school football game are \$7 and \$4 respectively. The ticket sales for one game totaled \$11,200.

Equation:

$$7x + 4y = 11,200$$

Variables:

x : # of general admission tickets

y : # of student admission tickets