NAME: _____   PERIOD: _____   DATE: _____

Homework Problem Set

1. Kristin spent $131 on shirts. Fancy shirts cost $28 and plain shirts cost $15. If she bought a total of 7 shirts, how many of each kind did she buy?

    Let f = the number of fancy shirts

    Let p = the number of plain shirts

    A. What is the cost of 1 fancy shirt? Of 2 fancy shirts? Of f fancy shirts?

    $$\$28 \qquad \$56 \qquad 28f$$

    B. What is the cost of 1 plain shirt? Of 2 plain shirts? Of p plain shirts?

    $$\$15 \qquad \$30 \qquad 15p$$

    C. Write an equation that describes the amount of money spent by Kristin.

    $$28f + 15p = 131$$

    D. Write an equation that describes the number of shirts Kristin bought using f and p.

    $$f + p = 7$$

    E. Determine the number of each type of shirt Kristin bought.

    $$28f + 15p = 131 \longrightarrow 28f + 15p = 131$$
    $$f + p = 7 \longrightarrow p = 7 - f$$

    $$28f + 15(7 - f) = 131 \qquad f + p = 7$$
    $$28f + 105 - 15f = 131 \qquad 2 + p = 7$$
    $$13f + 105 = 131 \qquad \boxed{p = 5}$$
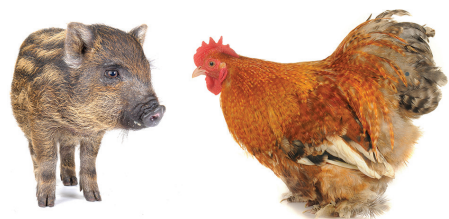 $$13f = 26$$
    $$\boxed{f = 2}$$

    2 fancy shirts
    5 plain shirts

2. There are 13 animals in the barn. Some are chickens and some are pigs. There are 40 legs in all. How many of each animal are in the barn?

   Let c = the number of chickens

   Let p = the number of pigs

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   A. Write an equation that describes the number of animals using c and p.

   $$C + p = 13$$

   B. Write an equation that describes the number of legs in the barn.

   $$2c + 4p = 40$$

   C. Determine the number of chickens and pigs in the barn.

   $2c + 4p = 40 \rightarrow 2c + 4p = 40$ $2c + 4(13-c) = 40$ $p = 13-c$
   $c + p = 13 \rightarrow p = 13-c$ $2c + 52 - 4c = 40$ $p = 13 - 6$
   $\boxed{6 \text{ chickens, } 7 \text{ pigs}}$ $-2c + 52 = 40$ $\boxed{p = 7}$
   $-2c = -12$
   $\boxed{c = 6}$

3. Pam has two part time jobs. At one job, she works as a cashier and makes $8 per hour. At the second job, she works as a tutor and makes $12 per hour. One week she worked 30 hours and made $268. How many hours did she spend at each job? Be sure to show your work and explain your thinking.

   $$C = \#\text{hours as cashier}$$
   $$t = \#\text{hours as tutor}$$
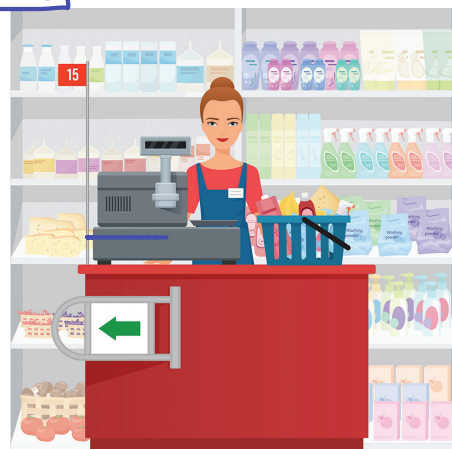
   © Lemberg Vector studio/Shutterstock.com

$$C + t = 30 \rightarrow t = 30 - C$$
$$8c + 12t = 268 \rightarrow 8c + 12t = 268$$

$$8c + 12(30-c) = 268$$
$$8c + 360 - 12c = 268$$
$$-4c + 360 = 268$$
$$-4c = -92$$
$$\boxed{C = 23}$$

$t = 30 - c$
$t = 30 - 23$
$\boxed{t = 7}$

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$$\boxed{27 \text{ hrs cashier}}$$
$$\boxed{3 \text{ hrs tutor}}$$

4. At a state fair, there is a game where you throw a ball at a pyramid of cans. If you knock over all of the cans, you win a prize. The cost is 3 throws for $1, but if you have an armband, you get 6 throws for $1. The armband costs $10.

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A. **Challenge**   Write two cost equations for the game in terms of the number of throws purchased, one without an armband and one with.
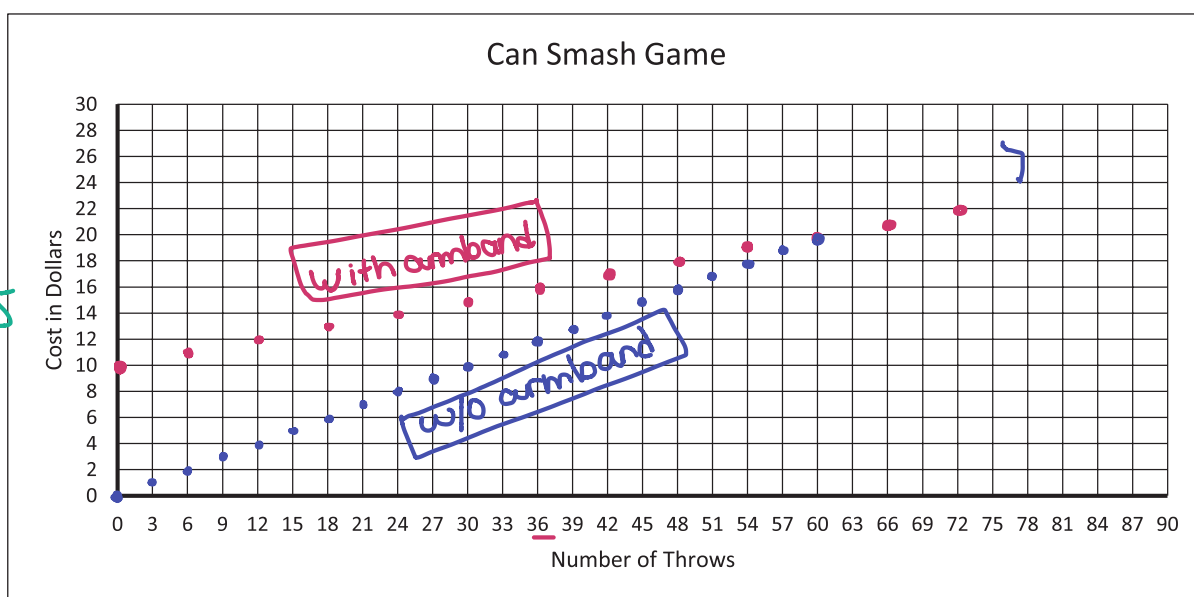
Let t = number of throws

Let c = total cost

w/o armband $y = \frac{1}{3}t$

with armband: $y = \frac{1}{6}t + 10$

B. Graph the two cost equations on the same graph. Think about whether this data is discrete or continuous.

Can Smash Game

60 throws

$20

Source: texasentertainmentgroup.com

C. Does it make sense to buy the armband? Explain your thinking.

If you throw more than 60 times, it would be best to buy an armband.