

PRACTICE QUESTIONS: Solving Word Problems

Date Solutions

PART A: Fill in the initial value, rate, and equation for the following situations. **DO NOT SOLVE.**

- The school council is trying to determine where to hold the athletic banquet. The Algebra Ballroom charges an \$800 flat fee and \$60 per person. The Geometry Hall charges a \$1000 flat fee and \$55 per person. Which location should the school council select for the athletic banquet?

Let C represent the cost of the hall (\$)

Let n represent the # people attending

Algebra Ballroom

Initial Value: \$800

Rate: \$60/person

Equation: $C = 60n + 800$

Geometry Hall

Initial Value: \$1000

Rate: \$55/person

Equation: $C = 55n + 1000$

- The yearbook club is considering two different companies to print the yearbook. The Descartes Publishing Company charges a flat fee of \$475 plus \$4.50 per book. School Memories charges a flat fee of \$550 plus \$4.25 per book. Which company should the yearbook club select to print this year's yearbook?

Let C represent charges from company (\$)

Let n represent # of yearbooks sold

Descartes Publishing

Initial Value: \$475

Rate: \$4.50

Equation: $C = 4.50n + 475$

School Memories

Initial Value: \$550

Rate: \$4.25

Equation: $C = 4.25n + 550$

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PART B: Solve the following word problems using substitution or elimination.

3. Carly rents a theatre for a spring concert. The theatre charges \$825 plus \$2 per person. Carly plans to charge \$7 per person. The cost and revenue can be represented by the following equations.

Cost: $d = 825 + 2p$ (1)

Revenue: $d = 7p$ (2)

a) What does each variable in the equation represent?

$d =$ amount in dollars

$p =$ # people

b) Solve the equation using SUBSTITUTION.

Sub (1) into (2)

$$\begin{aligned} 825 + 2p &= 7p \\ 825 &= 7p - 2p \end{aligned}$$

$$\frac{825}{5} = \frac{5p}{5}$$

$$165 = p$$

Sub. $p = 165$ into (2)

$$d = 7(165)$$

$$d = 1155$$

\therefore POI is $(1155, 165)$

c) How many people need to attend to break even? 165

d) How much would it cost for 200 people to attend the concert? $p = 200$

C: $d = 825 + 2(200)$

$$= 825 + 400$$

$$= 1225$$

\therefore it will cost \$1225 for 200 people to attend.

e) What will the revenue be if 200 people attend? $p = 200$

R: $d = 7p$

$$d = 7(200)$$

$$d = 1400$$

\therefore the revenue will be \$1400.

f) How much money will Carly make if 200 people attend?

Revenue - Cost

$$= 1400 - 1225$$

$$= 175$$

\therefore she will make \$175 if 200 people attend.

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4. A bank teller has a total of 75 bills in twenties and fifties. The total value of the money \$2400. The following equations represent the situation.

Total number of bills: $t + f = 75$ (1)

Total value: $20t + 50f = 2400$ (2)

- a) Define the variables in the equation.

$t =$ # twenty dollar bills

$f =$ # fifty dollar bills.

- b) Solve the system of equations using SUBSTITUTION OR ELIMINATION.

$$\begin{array}{r} t + f = 75 \quad (\times 20) \quad 20t + 20f = 1500 \\ 20t + 50f = 2400 \quad - \quad 20t + 50f = 2400 \\ \hline \end{array}$$

$$0 - 30f = -900$$

$$\underline{-30f = -900}$$

$$\underline{-30 \quad -30}$$

$$\boxed{f = 30}$$

sub $f = 30$ into (1)

$$t + (30) = 75$$

$$t = 75 - 30$$

$$\boxed{t = 45}$$

sol is (30, 45)

- c) How many of each bill is there?

There are 30 fifties and 45 twenties.

- d) If the teller made a mistake while counting, and she realizes that there are 43 twenty dollar bills, then how many fifty dollar bills are there?

$$t = 43$$

sub $t = 43$ into (1)

$$(43) + f = 75$$

$$f = 75 - 43$$

$$\boxed{f = 32} \therefore \text{there would be 32 fifties.}$$