

Solving Word Problems 1 – Number & Money Problems

Date: _____

Type: Number Problems:

Example: The sum of two numbers is 49. Their difference is 11. Determine the numbers.

Solution

Let x and y represent the numbers.

Type: Money Problems:

Example: Bob has a total of \$425 all in \$20 bills and \$5 bills. He has a total of 31 bills. How many \$20 bills does he have?

Solution

Let x represent the number of \$20 bills and let y represent the number of \$5 bills

Q24 P.104

Let x be the the ones digit
 Let y be the " tens "

$$(i) \quad x + y = 9 \quad x = 9 - y$$

$$(ii) \quad (10y + x) \times 2 - 36 = 10x + y$$

$$20y + 2x - 36 = 10x + y$$

$$(ii)' \quad 20y - y + 2x - 10x = 36$$

$$19y - 8x = 36$$

Sub (i) \rightarrow (ii)'

$$19y - 8(9 - y) = 36$$

$$19y - 72 + 8y = 36$$

$$27y = 36 + 72$$

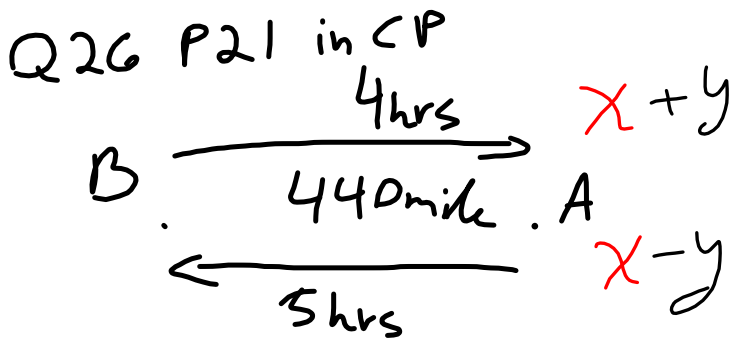
$$27y = 108$$

$$y = \frac{108}{27}$$

$$y = 4$$

$$x = 9 - y \quad x = 5$$

\therefore the number is
45



Let x be speed of plane in miles/hr

Let y " " " " wind " " "

$$(i) x + y = \frac{440}{4}$$

$$(ii) x - y = \frac{440}{5}$$

Q8 P18 CP

Let x be amount invested @ 12% / a
" y " " " " " " 8% / a

$$(i) x + y = 2000$$

$$(ii) x \times (0.12) = y(0.08)$$

Grade 10 Mathematics
Solving Word Problems 2

Date:

Therefore: He travelled 810 km by train

Type: Time, speed and distance problems.

Example: Sam travelled from Winnipeg to Calgary, a distance of 1210 km, partly by train and partly by bus. The train travels at 90 km/h and the bus travels at 80 km/h. If the total trip takes 14 hours, how far did he travel by train?

Solution:

| | speed | time | distance |
|-------|---------|------|----------|
| train | 90 km/h | x | 90x |
| bus | 80 km/h | y | 80y |
| total | | x+y | 90x+80y |

System of E.L. (i) (ii)

$$\begin{aligned} x+y &= 14 \\ 90x+80y &= 1210 \end{aligned}$$

$$\begin{aligned} x &= 14-y \\ \text{sub(i)} \rightarrow \text{(ii)} \\ 90(14-y)+80y &= 1210 \end{aligned}$$

$$\begin{aligned} 1260-90y+80y &= 1210 \\ -10y &= 1210-1260 \\ -10y &= -50 \\ \frac{-10y}{-10} &= \frac{-50}{-10} \\ y &= 5 \end{aligned}$$



remember distance = speed x time

$$90(5) = 810 \text{ km}$$

Type: Age problems.

Example: Sue is six years older than Joe. Four years ago (she was twice as old as Joe was). How old is Joe now?

Solution:

∴ Joe is 10 yo now!

| age | now | 4 years ago |
|-----|-----|-------------|
| Sue | x | x-4 |
| Joe | y | y-4 |

Let x represent Sue's current age; in years
let y represent Joe's current age.

$$\begin{aligned} \text{(i)} \quad x-y &= 6 \\ \text{(i)} \quad x &= 6+y \end{aligned}$$

$$\begin{aligned} \text{(ii)} \quad (y-4) \times 2 &= x-4 \\ 2y-8 &= x-4 \\ 2y-x &= 4 \end{aligned}$$

$$\begin{aligned} 2y-(6+y) &= 4 \\ 2y-6-y &= 4 \\ y-6 &= 4 \\ y &= 10 \\ x &= 16 \end{aligned}$$

Type: Percentage problems.

Example: Jennifer invested \$500 into two different investment plans. The first pays interest at 7% per annum. The second plan paid interest at 10% per annum. After one year the total interest she made was \$44. How much did she invest into each plan?

Let x represent the amount invested at 7% and let y represent the amount invested at 10%.

total money invested → \$500
total interest earned → \$44

$$\begin{aligned} \text{(i)} \quad x+y &= 500 \\ \text{(ii)} \quad 0.07x+0.1y &= 44 \end{aligned}$$

sub (i) → (ii)

$$\begin{aligned} 0.07(500-y)+0.1y &= 44 \\ 35-0.07y+0.1y &= 44 \\ 0.03y &= 44-35 \\ 0.03y &= 9 \end{aligned}$$

sub y = 300 → (i)

$$\begin{aligned} y &= 300 \\ x &= 500-y \\ x &= 200 \end{aligned}$$

∴ She invested \$300 in 10% plan
" " \$200 " 7% "
+ HW odd p. 18 CP