Warm Up

December 18, 2017

What are the five problem solving steps?

1. Read the problem (5)
2. Assign the variables 1
3. Create the equations 2
4. Solve the equations 1
5. Make conclusions 1

PAGE 396 - BUS QUESTION:

A school district has buses that carry 12 passengers and buses that carry 24 passengers. The total passenger capacity is 780. There are 20 more small buses than large buses.

How many small and large buses does the district have?

Let x = # small buses
Let y = # large buses

$12x + 24y = 780$ ... ①

$x = y + 20$ ... ②

Sub ② into ①

$12(y+20) + 24y = 780$

$12y + 240 + 24y = 780$

$36y = 780 - 240$

$\frac{36y}{36} = \frac{540}{36}$

$y = 15$ ... ③

Sub ③ into ②

$x = y + 20$

$= 15 + 20$

$= 35$

There are 15 large and 35 small buses.

Check

$12(35) + 24(15) \mid 780$

$420 + 360$

780

LS = RS

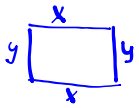
$\therefore x = 35$ & $y = 15$

PAGE 397 - PERIMETER QUESTION:

The perimeter of a Nunavut flag is 16 ft.
Its length is 2 ft. longer than its width.

What are the length and width of the flag?

Let x = length in ft
Let y = width in ft



$2x + 2y = 16$ ..... ①
$x = y + 2$ ..... ②

Sub ② into ①
$2(y+2) + 2y = 16$
$2y + 4 + 2y = 16$
$4y = 16 - 4$
$4y = 12$
$y = 3$ ..... ③

Sub ③ into ②
$x = y + 2$
$= 3 + 2$
$= 5$

The length is 5 ft and the width is 3 ft.

PAGE 410 - MUSEUM FIELD TRIP:

A group of adults and students went on a field trip to the Royal Tyrell Museum, near Drumheller, Alberta. The total admission fee was $152. There were 13 more students than adults. How many adults and how many students went on the field trip?

Let x = # adults
Let y = # students

$8x + 4.8y = 152$ ..① → $8x + 4.8y \mid 152$
$x + 13 = y$ ..... ②
$8(7) + 4.8(20) \mid$
$56 + 96$
152 LS = RS ✓

Sub ② into ①
$8x + 4.8(x+13) = 152$
$8x + 4.8x + 62.4 = 152$
$12.8x = 152 - 62.4$
$\frac{12.8x}{12.8} = \frac{89.6}{12.8}$
$x = 7$ ..... ③

Sub ③ into ②
$y = x + 13$
$= 7 + 13$
$= 20$

There are 7 adults + 20 students

PAGE 420 - INVESTMENTS:

Create a linear system to model this situation:

Nuri invested $2000, part at an annual interest rate of 8% and the rest at an annual interest rate of 10%. After one year, the total interest was $190.

Solve this problem: How much money did Nuri invest at each rate?

Let x = amt invested at 8%
Let y = amt invested at 10%

$x + y = 2000 \ldots$ ①

$0.08x + 0.10y = 190 \ldots$ ②

② x 100 $8x + 10y = 19\,000 \ldots$ ③

① x 8 $8x + 8y = 16\,000 \ldots$ ④

$2y = 3000$

$y = 1500 \ldots$ ⑤

Sub ⑤ into ①

$x + y = 2000$

$x + 1500 = 2000$

$x = 2000 - 1500$

$= 500$

The amt invested at 8% is $500 and the amt invested at 11% is $1500

PAGE 425 - INTERNET USE:

Forty-five high school students and adults were surveyed about their use of the internet. Thirty-one people reported a heavy use of the internet. This was 80% of the high school students and 60% of the adults. How many students and how many adults were in the study?

Interest Problems

A total of $12,000 is invested in two funds paying 9% and 11% simple interest. If the yearly interest is $1,180, how much of the $12,000 is invested at each rate?

Let x = amt at 9%
Let y = amt at 11%

$x + y = 12000$ ..... ①

$.09x + 0.11y = 1180$ .. ②

② x 100 $9x + 11y = 118000$ .... ③

① x 9 $9x + 9y = 108000$ .. ④

③ - ④ $2y = 10000$

$y = 5000$ .... ⑤

Sub ⑤ into ①

$x + y = 12000$

$x + 5000 = 12000$

$x = 12000 - 5000$

$= 7000$

$7000 will be invested at 9% and $5000 at 11%

Example #2:

Sales personnel at a sporting goods store are given a choice of 2 payment methods...

PLAN A: A weekly salary of $200 plus a 2 % commission on all sales.

PLAN B: No weekly salary but a 5 % commission on all sales.

Which is the better plan for the employee?

Let x = amt of sales for plans to be equal.

$200 + 0.02x = 0.05x$

$200 = 0.05x - 0.02x$

$\frac{200}{0.03} = \frac{0.03x}{0.03}$

$x = 6666.67$

Sales > 6666.67 Plan B is better

Sales < 6666.67 Plan A is better

Sales = 6666.67 plans pay the same

Page 441: #1 & #4

Page 448: #4, #5, #7

PRACTICE PROBLEMS...

p. 410: #11, 12, 13

p. 425: #11, 16, 17, 18

p. 437: #8, 10,