MAT 121 § 1.2 #s 17, 39, 47, 75

#s 5-20 Solve for the specified variable.

(17) $S = \frac{a_1 - a_1 r^n}{1-r}$ for a_1:

$$(1-r)S = a_1 - a_1 r^n$$

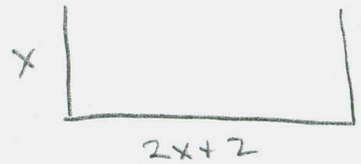
$$(1-r)S = a_1(1-r^n)$$

$$\boxed{\frac{(1-r)S}{1-r^n} = a_1}$$

(39) 30 ft. of molding in 3 pieces to trim a garage door. The long piece was 2 ft longer than twice the length of the shorter pieces. Find the length of each piece.

Let x = the length of the shorter pieces (ft)

Then $2x+2$ is the length of the long piece.



Then $x + x + 2x + 2 = 30$

$\Rightarrow 4x + 2 = 30$

$4x = 28$

$\boxed{x = 7 \text{ ft}}$ ¢

$\boxed{2x+2 = 16 \text{ ft}}$

MAT 121 §1,2 #547, 75

(47) "She" used two different investments. One earned 5%; the other earned 6%. The total return was $5880. The 6% account started with $10000 more than the 5% ". How much total money did she invest?

Let x = the amount invested @ 5% ($)

y = " " " " 6% "

z = " total amount invested.

We know $x + y = z$ = FINAL ANSWER

$.05x + .06y = 5880$ } use these to find x & y.

$y = x + 10000$ }

$.05x + .06(x + 10000) = 5880$

$.05x + .06x + 600 = 5880$

$.11x + 600 = 5880$

$.11x = 5280$

$x = \frac{5280}{.11} = 48000$

$\Rightarrow y = 48000 + 10000 = 58000 = y$

$x + y = 48,000 + 58,000 = \boxed{\$106,000 = z}$

MAT 121 §1.2 #75

(75) "He" has 5 gal. of salt solution with a concentration of .2 pounds per gal, and another that's .5 pounds per gal. How much (in gallons) of the strong stuff should be added to the weak stuff for a solution that's 0.3 pounds per gallon?

Let x = the amount (in gallons) of the .5 $\frac{lb}{gal}$ stuff.

Then $x+5$ = Total volume of .3 $\frac{lb}{gal}$ stuff

and $.3(x+5)$ = Total Salt in final mix.

We can also write this last as

$.5x + .2(5)$, so

$.5x + .2(5) = .3(x+5)$

$.5x + 1 = .3x + 1.5$

$.5x = .3x + .5$

$.2x = .5$

$x = \frac{.5}{.2} =$ 2.5 gallons of .5 $\frac{lb}{gal}$ mix.