4.5 Model With Algebra (Day 2)

Do It Now!

Write an equation for each phrase:

a) triple a number is 18 $3x = 18$

b) 7 more than a number is 11 $x + 7 = 11$

c) half a number is 10 $\frac{x}{2} = 10$

d) double a number, less 3 is 7 $2x - 3 = 7$

e) 5 less than one third a number is 1 $\frac{x}{3} - 5 = 1$

f) 2 more than triple a number is 14 $3x + 2 = 14$

Part 2: Word Problems

When solving word problems,

- define the unknowns.
- write an equation to model the situation.
- solve the equation.
- answer the question asked in the problem.

1) The length of a rectangle is triple its width. The perimeter of the rectangle is 40 cm. What are the length and width?

Length $= 3x$

Width $= x$

$P = 2(\text{length}) + 2(\text{width})$

$40 = 2(3x) + 2(x)$

$40 = 6x + 2x$

$\frac{40}{8} = \frac{8x}{8}$

$x = 5$

Length $= 3x = 15\text{cm}$

Width $= x = 5\text{cm}$

2) Three consecutive integers have a sum of 75. What are the three integers?

1st integer $= x$

2nd integer $= x+1$

3rd integer $= x+2$

$x+(x+1)+(x+2)=75$

$x+x+1+x+2=75$

$3x+3=75$

$3x=75-3$

$\frac{3x}{3}=\frac{72}{3}$

$x=24$

1st integer $= x = 24$

2nd integer $= x+1 = 25$

3rd integer $= x+2 = 26$

3) Three consecutive even integers have a sum of 102. What are the three integers?

1st integer $= 2x$

2nd integer $= 2x+2$

3rd integer $= 2x+4$

$2x+(2x+2)+(2x+4)=102$

$2x+2x+2+2x+4=102$

$6x+6=102$

$6x=102-6$

$\frac{6x}{6}=\frac{96}{6}$

$x=16$

1st integer $= 2x = 32$

2nd integer $= 2x+2 = 34$

3rd integer $= 2x+4 = 36$

4) Katherine is 2 years older than Christine. The sum of their ages is 16. How old is each girl?

Katherine $= x+2$

Christine $= x$

$x + (x+2) = 16$

$x + x + 2 = 16$

$2x + 2 = 16$

$2x = 16 - 2$

$\frac{2x}{2} = \frac{14}{2}$

$x = 7$

Katherine $= x+2 = 9$ years old

Christine $= x = 7$ years old.