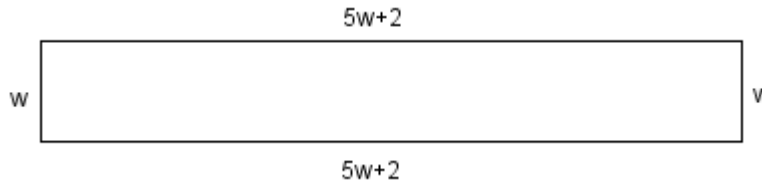


Word Problem Equations

Rectangle Problem: The length of a rectangle is 2 more than five times its width. The perimeter is 64 inches. What is the length of the rectangle.

Solution: First we name the variable for width w . Since the length is 2 more than five times its width then the length is $l = 5w + 2$. Drawing the rectangle and labeling the sides we have,



Since we find the perimeter by adding all the sides together then

$$(w) + (5w + 2) + (w) + (5w + 2) = 64$$

$$w + 5w + 2 + w + 5w + 2 = 64$$

$$12w + 4 = 64$$

$$12w = 60$$

$$w = 5$$

Since $w = 5$ and $l = 5w + 2$ then $l = 5w + 2 = 5(5) + 2 = 27$.

Consecutive Integer Problem: The sum of two consecutive even integers is 350. What are the integers?

Solution: Since every even integer can be written $2n$ then the next even integer will be $2n + 2$. So, the sum of those two integers is

$$(2n) + (2n + 2) = 350$$

$$2n + 2n + 2 = 350$$

$$4n + 2 = 350$$

$$4n = 348$$

$$n = 87$$

Then the first even integer is $2n = 2(87) = 174$ and the second is $2n + 2 = 2(87) + 2 = 176$.

Same Direction Travel \rightarrow : Suppose Richard leaves the South Carolina welcome station at 1pm. driving 60 mph and Juanita leaves 1 hour later driving 70 mph. How long with it take Juanita to catch up to Richard?

Solution: Let t be the time traveled. Then we complete the chart

Person	Rate	Time	Distance
Richard	60	t	$60t$
Juanita	70	$t - 1$	$70(t - 1)$

For Juanita to catch up to Richard she will have to travel the same distance as Richard. So,

$$60t = 70(t - 1)$$

$$60t = 70t - 70$$

$$-10t = -70$$

$$t = 7$$

So, it was 7 hours before Juanita to caught up to Richard.

Round Trip Travel \rightarrow : Margaret drove 25 mph slowly on her way to work because of a heavy fog. On the way home she averaged 10 mph faster because the weather was clear. The total time for her to travel both ways was 1 hour and 20 minutes. How long did it take her to get to work?

Direction	Rate	Time	Distance
To	20	t	$25t$
From	30	$1\frac{1}{3} - t$	$45(1\frac{1}{3} - t)$

Since she traveled the same distance in both directions then

$$20t = 30(1\frac{1}{3} - t)$$

$$20t = 30(\frac{4}{3}) - 30t$$

$$20t = 40 - 30t$$

$$50t = 40$$

$$t = \frac{4}{5}$$

Since $\frac{4}{5}(60) = 48$ then it took 48 minutes for Margaret to get to work.

Opposite Direction Travel $\leftarrow \circ \rightarrow$: Nick and Timophey walk away from the school in opposite direction down Providence Rd. Timophey is walking 1 mph faster than Nick. In two hours they are 14 miles apart. How fast are Nick and Timophey walking?

Solution: We fill out the chart

Person	Rate	Time	Distance
Nick	r	2	$2r$
Timophey	$r + 1$	2	$2(r + 1)$

Since they walked a total of 14 miles then $2r + 2(r + 1) = 14$, $4r + 2 = 14$, $4r = 12$ and $r = 3$. So that Nick walked 3 mph and Timophey walked 4 mph.