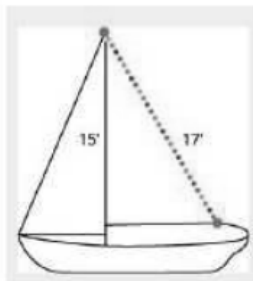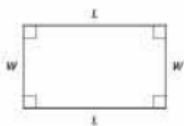John puts the base of a 13-foot ladder five feet from the wall of his house as shown below. How far up the wall does the ladder reach?

Randy want to attach a 17 foot string of lights to the top of the 15 foot mast of his sailboat, as shown below. How far from the base of the mast should he attach the end of the string?

Rectangles

Properties — 4 sides

4 - Sides

4 - Right Angles

2 Pairs of opposite sides the same length

Diagonals are the same length

$P = 2l + 2w$

$A = lw$

Perimeter
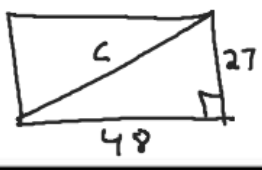
Area

The length of a rectangle is 32 meters and the width is 20 meters. What is the perimeter.

$$P = 2l + 2w$$
$$= 2(32) + 2(20)$$
$$64 + 40 = 104\,m$$

The area of a rectangluar room is 168 square feet. The length is 14 feet. What is the width?

$$A = lw$$
$$\frac{168}{14} = \frac{14w}{14}$$

$$w = 12\,ft$$

Find the length of a rectangle with perimeter if 50 inches and width 10 inches.

$$P = 2l + 2w \qquad\qquad 30 = 2l$$
$$50 = 2l + 2(10) \qquad l = 15\,in$$
$$50 = 2l + 20$$

The width of a rectangle is two feet less than the length. The perimeter is 52 feet. Find the length and width.

$$P = 2l + 2w$$
$$52 = 2l + 2(l-2) \qquad l = 14\,ft$$
$$52 = 2l + 2l - 4 \qquad w = 12\,ft$$
$$56 = 4l$$

$P = 52$
Length $= l$
Width $= l - 2$

The width of a rectangle is seven meters less than the length. The perimeter is 58 meters. Find the length and width.

$$58 = 2l + 2(l-7) \qquad 4l = 72$$
$$58 = 2l + 2l - 14 \qquad l = 18\,m$$
$$58 = 4l - 14 \qquad\qquad w = 11\,m$$

$P = 58$
$w = l - 7$
$l = l$

The perimeter of a rectangluar swimimg pool is 200 feet. The length is 40 feet more than the width. Find the length and width.

$$200 = 2(w+40) + 2w \qquad w = 30$$
$$200 = 2w + 80 + 2w \qquad l = 70$$
$$120 = 4w$$

$P = 200$
$l = w + 40$
$w = w$

The perimeter of the TV screen is 150 inches. The length is six less than 2 times the width. Find the length and width. What is the size of the TV. (TV's are measured by the length of the diagonal of the screen.

$$150 = 2w + 2(2w - 6) \qquad (27)^2 + (48)^2 = c^2$$
$$= 2w + 4w - 12 \qquad 729 + 2304 = c^2$$
$$150 = 6w - 12 \qquad \sqrt{3033} = \sqrt{c^2}$$
$$162 = 6w \qquad\qquad c \approx 55''$$
$$w = 27''$$

$P = 150$
$w = w$
$l = 2w - 6$

$$l = 2(27) - 6$$
$$l = 48''$$

P:tts   DC

Local |————————————5hr———————|

Express | 12 mph   4hr |
        | Faster |

[

An express train and a local train leave Pittsburgh to travel to Washington D.C. the express train and make the trip in 4 hours and the local train takes 5 hours for the trip. The speed of the express train is 12 miles per hour faster thatn the speed of the local train. Find the speed if both trains.

$D = rt$

	Rate ·	Time	= Distance
Local	X	5	5x
Express	(X + 12)	4	4(x+12)
	48+12=60		

$$5x = 4(x+12)$$
$$5x = 4x + 48$$
$$x = 48 \text{ mph}$$

Local → 48 mph

Express → 60 mph

RSP   Bach

Dennis | 7 mph   1.5hr |
       | Faster |
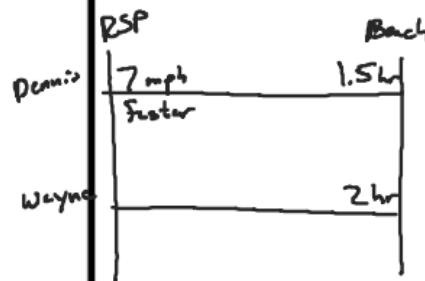
Wayne |————————————2hr———|

Wayne and Dennis like to ride the bike path from Riverside Park to the beach. Dennis's speed is seven miles per hour faster than Waynes's speed, so it takes Wayne 2 hours to ride to the beach while it takes Dennis 1.5 hours for the ride. Find the speed of both bikes.

	Rate ·	Time	= Distance
Dennis	X+7	1.5	1.5(x+7)
Wayne	X	2	2x

$$2x = 1.5(x+7)$$
$$2x = 1.5x + 10.5$$
$$.5x = 10.5$$
$$x = 21 \text{ mph}$$

Wayne = 21 mph

Dennis = 28 mph

Jeremy can drive from his house in Cleveland to his college in Chicago in 4.5 hours. It takes his mother 6 hours to make the same drive. Jeremy drives 20 miles per hour faster than his mother. Find Jeremy's speed and his mother's speed.

Jeremy
80 mph

Mom
60 mph

Chris and his parents live 115 miles appart. They met at a restaurant between their homes to celebrate his mother's birthday. Chris drive 1.5 hours while his parents drove 1 hour to get to the restaurant. Chris's average speed was 10 miles per hour faster than his parents' average speed. What where the average speeds of Chris and of his parents as they drove to the restaurant?

Chris   1.5h | 1 hr   Par
    d | d
      (115)

	Rate ·	Time	= Distance
Parents	X	1	X
Chris	X+10	1.5	1.5(X+10)

$$X + 1.5(X+10) = 115$$
$$X + 1.5X + 15 = 115$$
$$2.5X + 15 = 115$$
$$2.5X = 100$$

$$X = 40 \text{ mph} \longrightarrow \text{Parents}$$
$$50 \text{ mph} \longrightarrow \text{Chris}$$

Carrie is driving from her home in Anaheim to Berkeley on the same day here brother is driving from Berkeley to Anaheim, so they decide to meet for lunch along the way in Buttonwillow. The distance from Anaheim to Berkeley is 410 miles. It takes Carrie 3 hours to get to Buttonwillow, while her brother drives 4 hours to get there. The average speed Carrie's brother drove was 15 miles per hour faster than Carrie's average speed. Find Carrie's and her brother's average speed.

An   Button   Ber
Carr   Br
  3hr   4hrs   15 mph
                 Faster
          (410)

Car	X	3	3x
Br	x+15	4	4(x+15)

$$3x + 4(x+15) = 410$$
$$3x + 4x + 60 = 410$$
$$7x = 350$$
$$x = 50 \text{ mph}$$

Carrie $\longrightarrow$ 50mph
Brother $\longrightarrow$ 65mph