

1) Find the square roots of 25. **-5, 5** because  $(-5)^2 = 25$  and  $(5)^2 = 25$

2) Find all the real square roots of  $\frac{121}{144}$ .  **$-\frac{11}{12}, \frac{11}{12}$**  because  $(-\frac{11}{12})^2 = \frac{121}{144}$  and  $(\frac{11}{12})^2 = \frac{121}{144}$

3) A space plane skims the edge of space at 2000 miles per hour. Neglecting altitude, if the circumference of the planet is approximately 29,000 miles, how long will it take for the plane to travel around the planet?

$$\text{distance} = \text{rate} \cdot \text{time}$$

$$d = rt$$

$$29,000 = 2000t$$

$$t = 14.5 \text{ hours}$$

rate is 2000 mph

distance is 29,000 miles

divide by 2000

4) A space plane skims the edge of space at 5000 miles per hour. Neglecting altitude, if the circumference of the planet is approximately 25,000 miles, how long will it take for the plane to travel around the planet?

$$\text{distance} = \text{rate} \cdot \text{time}$$

$$d = rt$$

$$25,000 = 5000t$$

$$t = 5 \text{ hours}$$

r = rate is 5000 mph

d = distance is 25,000 miles

divide by 5000

5) An architect designs a rectangular flower garden such that the width is exactly two-thirds of the length. If 330 feet of antique picket fencing are to be used to enclose the garden, find the dimensions of the garden.

$$P = 2l + 2w$$

$$330 = 2l + 2\left(\frac{2}{3}l\right)$$

$$330 = 2l + \frac{4}{3}l$$

$$330 = \frac{10}{3}l$$

$$l = 99 \text{ feet}$$

$$w = \frac{2}{3}l \rightarrow \frac{2}{3}(99) = 66 \text{ feet}$$

p = perimeter is 330 feet

w = width is  $\frac{2}{3}l$

$$2 + \frac{4}{3} = \frac{10}{3}$$

divide by  $\frac{10}{3}$

- 6) An architect designs a rectangular flower garden such that the width is exactly two-thirds of the length. If 260 feet of antique picket fencing are to be used to enclose the garden, find the dimensions of the garden.

$$P = 2l + 2w$$

p = perimeter is 260 feet

$$260 = 2l + 2\left(\frac{2}{3}l\right)$$

w = width is  $\frac{2}{3}l$

$$260 = 2l + \frac{4}{3}l$$

$$2 + \frac{4}{3} = \frac{10}{3}$$

$$260 = \frac{10}{3}l$$

divide by  $\frac{10}{3}$

$$l = 78 \text{ feet}$$

$$w = \frac{2}{3}l \rightarrow \frac{2}{3}(78) = 52 \text{ feet}$$

- 7) The Cat is a high-speed catamaran auto ferry that operates between City A and City B. The Cat can make the trip in about  $3\frac{1}{2}$  hours at a speed of 56 mph. About how far apart are City A and City B?

miles per hour

$$\text{distance} = \text{rate} \cdot \text{time}$$

r = rate is 56 mph

$$d = rt$$

t = time is  $3\frac{1}{2}$  hours

$$d = 56\left(3\frac{1}{2}\right)$$

divide by  $3\frac{1}{2}$  hours

$$d = 196 \text{ miles}$$

- 8) The Cat is a high-speed catamaran auto ferry that operates between City A and City B. The Cat can make the trip in about  $2\frac{1}{2}$  hours at a speed of 54 mph. About how far apart are City A and City B?

miles per hour

$$\text{distance} = \text{rate} \cdot \text{time}$$

r = rate is 54 mph

$$d = rt$$

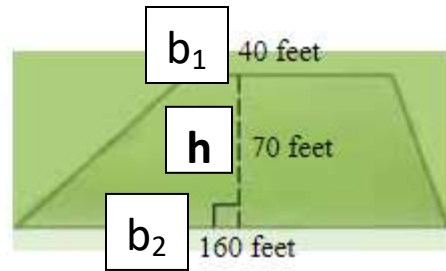
t = time is  $2\frac{1}{2}$  hours

$$d = 54\left(2\frac{1}{2}\right)$$

divide by  $2\frac{1}{2}$  hours

$$d = 135 \text{ miles}$$

- 9) A lawn is in the shape of a trapezoid with a height of 70 feet and bases of 40 feet and 160 feet. How many full bags of fertilizer must be purchased to cover the lawn if each full bag covers 4000 square feet and only full bags of fertilizer can be bought?



$$A = \frac{1}{2} h(b_1 + b_2)$$

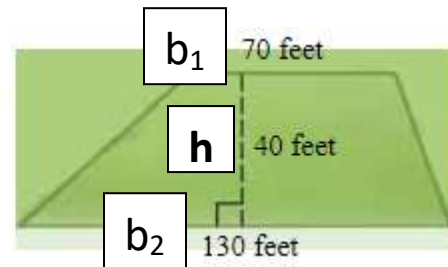
$$A = \frac{1}{2} (70)(40 + 160)$$

$$A = 7000 \rightarrow \text{bags are 4000 (divide)}$$

$$A = \frac{7000}{4000} = 1.75 \text{ rounds up to } \mathbf{2 \text{ bags}}$$

**\*\*ALWAYS ROUND UP**

- 10) A lawn is in the shape of a trapezoid with a height of 40 feet and bases of 70 feet and 130 feet. How many full bags of fertilizer must be purchased to cover the lawn if each full bag covers 2000 square feet and only full bags of fertilizer can be bought?



$$A = \frac{1}{2} h(b_1 + b_2)$$

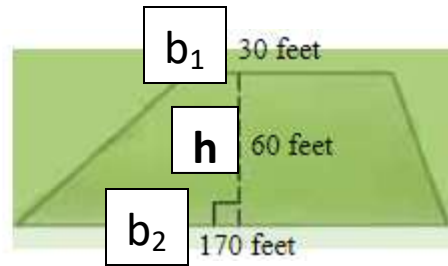
$$A = \frac{1}{2} (40)(70 + 130)$$

$$A = 7000 \rightarrow \text{bags are 2000 (divide)}$$

$$A = \frac{7000}{2000} = 3.2 \text{ rounds up to } \mathbf{4 \text{ bags}}$$

**\*\*ALWAYS ROUND UP**

- 11) A lawn is in the shape of a trapezoid with a height of 60 feet and bases of 30 feet and 170 feet. How many full bags of fertilizer must be purchased to cover the lawn if each full bag covers 6000 square feet and only full bags of fertilizer can be bought?



$$A = \frac{1}{2}h(b_1 + b_2)$$

$$A = \frac{1}{2}(60)(30 + 170)$$

$A = 6000 \rightarrow$  bags are 6000 (divide)

$$A = \frac{6000}{6000} = \mathbf{1 \text{ bag}}$$

- 12) A "bullet" train set a new world record for train speed at 549 kilometers per hour during a manned test run on the Test Line in April 1999. The Test Line is 42.4 kilometers long. How many minutes would a test run on the Test Line last at this record-setting speed?

**kilometers per hour**

distance = rate · time

$r = 549 \text{ kph}$

$d = rt$

$d = 42.2 \text{ km}$

$42.2 = 549t$

divide by 549

$$t = \frac{42.2}{549} = \text{enter then press } \times 60$$

multiply by 60 to get minutes  $t = \mathbf{4.612 \text{ min}}$

- 13) A "bullet" train set a new world record for train speed at 552 kilometers per hour during a manned test run on the Test Line in April 1999. The Test Line is 42.2 kilometers long. How many minutes would a test run on the Test Line last at this record-setting speed?

kilometers per hour

$$\text{distance} = \text{rate} \cdot \text{time}$$

$$d = rt$$

$$42.2 = 552t$$

$$t = \frac{42.2}{552} = \text{enter then press } \times 60$$

$$\text{multiply by 60 to get minutes} \quad t = 4.59 \text{ min}$$

- 14) Find how long it takes Tran Nguyen to drive 630 miles on I-50 if he merges onto I-50 at 5 pm and drives nonstop with his cruise control set on 70 mph.

$$\text{distance} = \text{rate} \cdot \text{time}$$

$$d = rt$$

$$630 = 70t$$

$$r = 70 \text{ mph}$$

$$d = 630 \text{ m}$$

$$t = 9 \text{ hours}$$

- 15) Find how long it takes Tran Nguyen to drive 560 miles on I-20 if he merges onto I-20 at 9 pm and drives nonstop with his cruise control set on 70 mph.

$$\text{distance} = \text{rate} \cdot \text{time}$$

$$d = rt$$

$$560 = 70t$$

$$r = 70 \text{ mph}$$

$$d = 560 \text{ m}$$

$$t = 8 \text{ hours}$$