

**Math 1000 – Semester Review**

Name \_\_\_\_\_

$$a_n = a_1 + d(n - 1)$$

$$S_n = \frac{n}{2}(a_1 + a_n)$$

$$a_n = a_1 r^{n-1}$$

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

**-3, 1, 5, 9...** Arithmetic Sequence or Geometric Sequence?

Find the 10<sup>th</sup> term.

Find the 50<sup>th</sup> term.

Find the sum of the first 50 terms.

**2, 8, 32, 128,...** Arithmetic Sequence or Geometric Sequence?

Find the 15<sup>th</sup> term.

Find the sum of the first 15 terms.

9 is what percent of 40?

75 is 62% of what?

Peyton made 87% of his free throws last year. He shot a total of 148 free throws. How many did he make?

Set up an equation and solve. Tom increased his savings account by 24% and now has \$5,240.24 in his account. How much was in the account before the deposit?

A friend used to weigh 165 and now weighs 180. What is the percent of increase?

**Simple Interest:**  $I = Prt$  (P is principal, r is the annual interest rate as a decimal, t is time in years)

**Calculating the amount for compound interest paid n times per year:**  $A = P(1 + \frac{r}{n})^{nt}$

**Calculating the amount for compounding continuously:**  $A = Pe^{rt}$

**Loan Payment Formula (for homes, cars, etc.)** You can also use the APPS on your Graphing Calculator.

$$PMT = \frac{P(\frac{r}{n})}{[1 - (1 + \frac{r}{n})^{-nt}]}$$

You invest \$2,000 into an account that pays 6%, compounded monthly. How much would the investment be worth in 20 years?

You invest \$3,000 into an account that pays 5.5%, compounded continuously. How much would the investment be worth in 10 years?

You invest \$5,000 into an account that pays 6%, compounded quarterly. How much would the investment be worth in 20 years?

You buy a house for \$200,000 and make a down payment of \$20,000 and need to finance the rest at a 5.25% annual interest rate. What would your monthly payments be if the loan is for 30 years?

You buy a car for \$12,000 and make no down payment. You finance it at a 6% annual interest rate. What would your monthly payments be if you paid it off in 3 years?

You lend a friend \$500 and ask him to pay you back in 2 years at 8% simple interest. How much interest are you charging and how much does your friend need to pay you back?

You borrow \$800 from a cousin and have to pay her back \$1,016 in 3 years. If she is using simple interest, what interest rate is she charging?

**Doubling Time Growth Model**  $A = A_0 2^{\frac{t}{d}}$  A = Population at time t,  $A_0$  is Population at time 0, d = Doubling time  
 Scobey has a population of about 1,140 and it is estimated that the population will double every 20 years.

What will be the population in 8 years?

What will be the population in 2044?

**Relative Growth Rate**  $A = A_0 e^{kt}$  A = Population at time t,  $A_0$  is Population at time 0, k = relative growth rate (as a decimal)  
 The population in Wyoming has a relative growth rate of 1.8% per year. It is estimated that there were 490,000 people in Wyoming in 2000.

What is Wyoming's present population?

How about in 2040?

**Half-life (Negative Exponential Growth)**  $A = A_0 \left(\frac{1}{2}\right)^{\frac{t}{h}}$  A = Amount at time t,  $A_0$  = Amount at time t=0, h = half-life

Gundoarium-115 has a half-life of 3 minutes. A fresh sample weighing 90 g was obtained. If it takes 10 minutes to set up an experiment using Gundoarium-115, how much Gundoarium-115 will be left when the experiment begins?

### **Variation Problems**

y varies directly with x.  $y=18$ , when  $x = 3$ , find y when  $x = 4$

t varies inversely with the square of v.  $t = 8$  when  $v = 3$ . Find t, when  $v = 200$

y varies jointly with the square root of x and the cube of t.  $y = 48$  when  $x=9$  and  $t=2$ . Find y when  $x=16$  and  $t= 1$ .

The time (t), in hours, it takes to travel to Cheyenne varies inversely with your rate of speed (r), in mph. If it takes you 4 hours traveling at 60 miles per hour, how fast do you need to drive if you want to arrive in 3 hours?

Convert the following. You do NOT need to show work in this section.

134 mm to meters \_\_\_\_\_ meters

2.14 kilograms to centigrams \_\_\_\_\_ centigrams

23.4 meters to centimeters \_\_\_\_\_ centimeters

450 milliliters to liters \_\_\_\_\_ liters

Convert the following. **Show your work.**

24 miles to feet

7.2 liters to quarts

6.3 inches to centimeters

251 centimeters to feet

45 feet per second to miles per hour

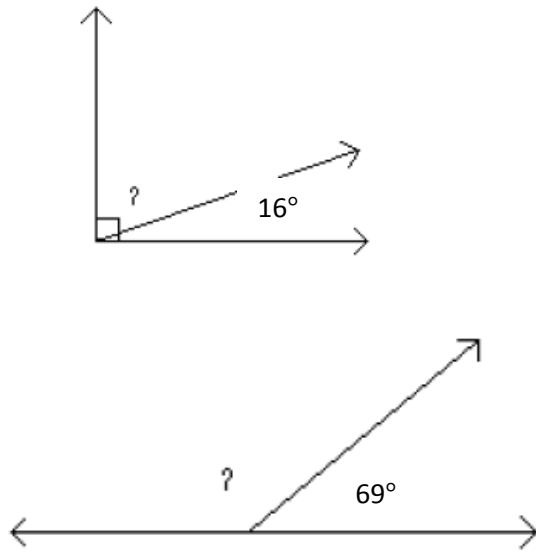
**Volume of Cylinder:  $V = \pi r^2 h$**

**Volume of Cone:  $V = \frac{1}{3} \pi r^2 h$**

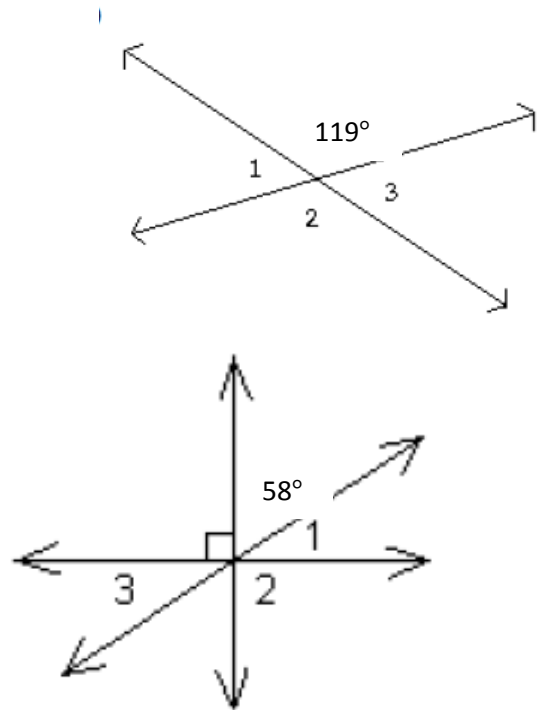
**Volume of Pyramid:  $V = \frac{1}{3} B h$**

**Area of Trapezoid:  $A = (\frac{b_1 + b_2}{2}) h$**

Find the measure of the angle in which  $^\circ$  appears.

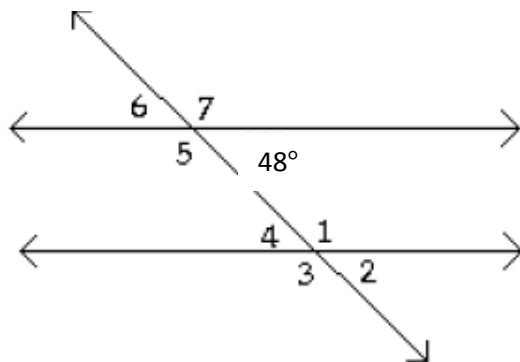


Find the measures of angles 1, 2, and 3.

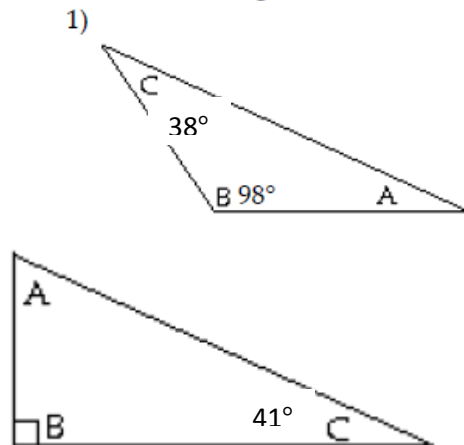


The diagram below shows two parallel lines and a transversal.

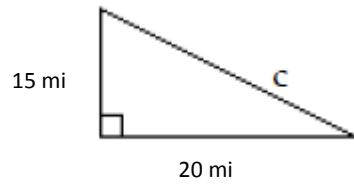
Measure of angle 1 is \_\_\_\_\_  
 Measure of angle 2 is \_\_\_\_\_  
 Measure of angle 3 is \_\_\_\_\_



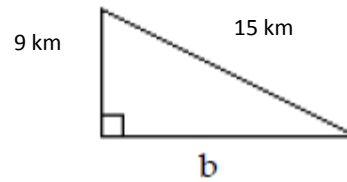
Find the measure of angle A for the triangle shown.



Find the length of the missing side of the triangle. Show your work.



Find the length of the missing side of the triangle. Show your work.

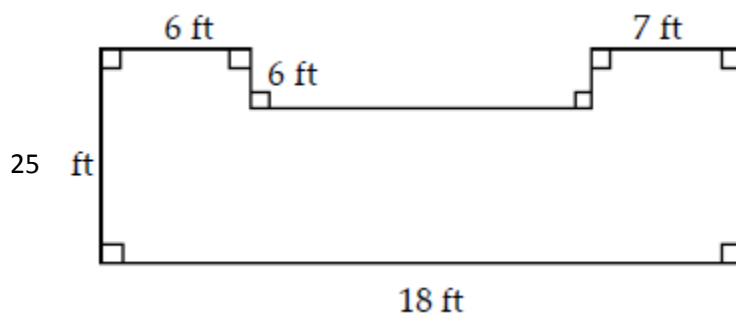


Tim and John are leaning a 22-foot ladder against their house. If the ladder reaches 19 feet up the house, how far is the bottom of the ladder from the base of the house. Round to the nearest tenth.

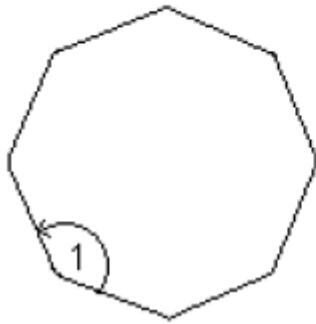
Find the perimeter and area of the following figure. Label your answer.

Perimeter is \_\_\_\_\_

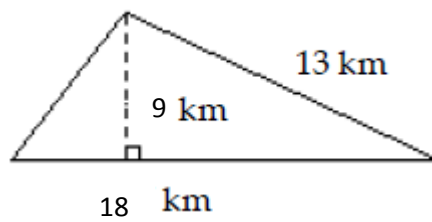
Area is \_\_\_\_\_



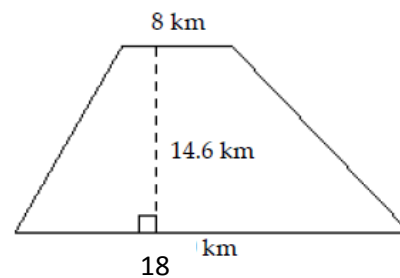
The figure shows a regular polygon. Find the measure of angle 1.



Find the area of the triangle. Label your answer.

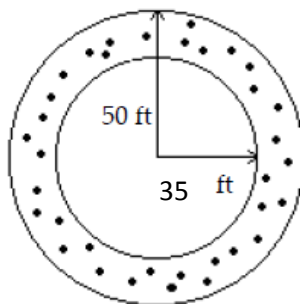


Find the area of the trapezoid. Label your answer.



What will it cost to tile a rectangular floor measuring 255 feet by 28 feet if the tile costs \$16 per square foot?

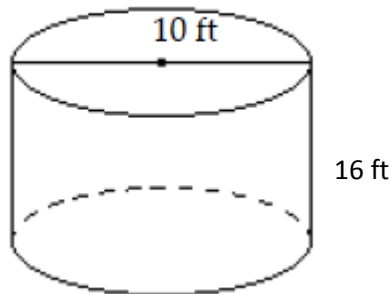
If asphalt pavement costs \$0.90 per square foot, find the cost to pave the circular road (indicated by dots) in the figure shown.



Find the volume and surface area of the cylinder. Label your answer.

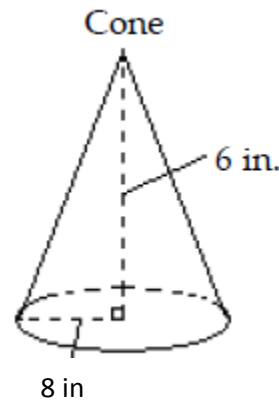
Volume is \_\_\_\_\_

Surface area is \_\_\_\_\_



Find the volume of the cone. Label your answer.

Volume is \_\_\_\_\_

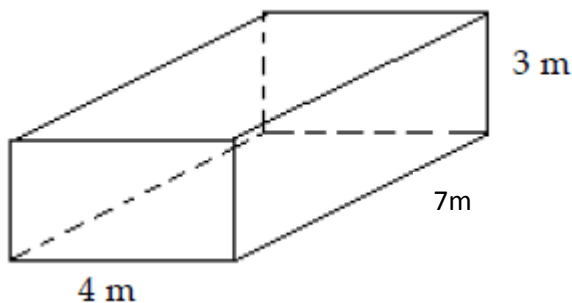


A new pyramid has been found in South America. The pyramid has a rectangular base that measures 78 yd by 100 yd, and has a height of 100 yd. The pyramid is not hollow like the Egyptian pyramids and is composed of layer after layer of cut stone. The stone weighs 468 lb per cubic yard. How many pounds does the pyramid weigh?

Find the surface area and volume and label your answer.

Surface area = \_\_\_\_\_

Volume = \_\_\_\_\_





A lock on a brief case uses a code that consists of 1 letter followed by two numbers. The numbers cannot repeat themselves. How many different combinations are there for this lock?

What is the probability of opening the lock on your first attempt?

What are the odds in favor of opening the lock on your first attempt?

What are the odds **against** opening the lock on your first attempt?

An ice cream truck offers two different kinds of cones, 4 different flavors of ice cream, and 5 different toppings. How many different orders can a person make at this business if you can have one cone, one type of ice cream with one topping?

In how many ways can a group of All-American runners be chosen if 5 athletes are picked as All-Americans in a race of 30 runners?

How many different ways could the 30 runners above finish 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup>?

A standard deck of 52 cards are used and you are dealt one card. What is the probability of being dealt a:

Jack of Clubs?

A card with an even number?

A face card?

A black card?

2 cards a dealt. What is the probability:

That the first card is a red Queen and the second card is Ace?

That both cards are black?

The first card is black and the second card is red, **or** the first card is an Ace and the second card is an Ace.

You checked out the Pronghorn's basketball stats and noticed that their point guard is shooting 32% on his 3 pointers. He is just ready to shoot another 3 pointer. What are the odds in favor of him making the 3 pointer?

Here are the potential test scores on our final exam: 81, 85, 92, 71, 66, 100, 97, 92, 55

Find the following:

Mean:

Median:

Mode:

Range:

Midrange:

Standard Deviation:

Construct a Grouped Frequency Distribution (with 10 as the class width) to represent the data:

Create a Histogram to represent the data: