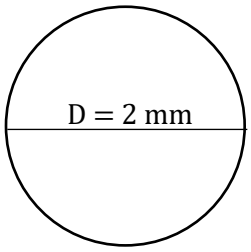
Unit 3.1 Linear Formulas and Equations

1. Solve the following using geometric formulas

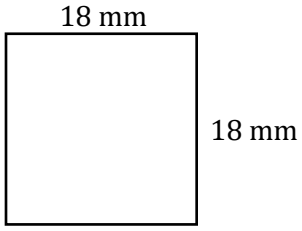
a.



Area = _____

Circumference = _____

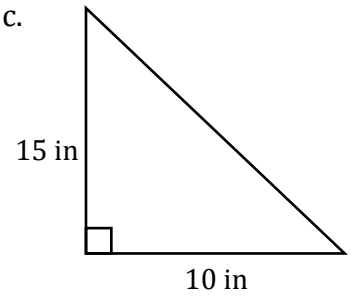
b.



Perimeter = _____

Area = _____

c.



Area = _____

d.

Area = _____

Perimeter = _____

2. Solve the following in terms of the variable requested

   a. $P = a + b + c$ $\quad b =$ _____

   b. $A = \frac{m+n}{2}$ $\quad m =$ _____

   c. $R = \frac{3(x-12)}{8}$ $\quad x =$ _____

3. List the equations associated with Ohms Law and the Power Wheel

Ohms Law	Power Wheel
V = _____ * _____	P = _____ * _____
I = _____ / _____	I = _____ / _____
R = _____ / _____	V = _____ / _____

4. Solve the following using Ohms Law or the Power Equations
   a. If $V = 24V$ and $I = 20$ mA, solve for R

   b. If $E = 100V$ and $R = 50\Omega$, solve for I

   c. If $R = 1k\Omega$ and $I = 5mA$, solve for V

d. If $P = 20W$ and $I = 10mA$, solve for V

e. If $E = 50$ V and $I = 10$ mA, solve for P

f. If $V = 5$ V and $P = 5$ W, solve for I

5. Solve for the following using the frequency and capacitor and inductor reactance equations

   a. If $L = 2$ mH and $C = 10$ nF, solve for F_R

   b. If $F = 10$ kHz and $L = 20$ mH, solve for X_L

   c. If $F = 100$ Hz and $C = 30$ μF, solve for X_C

6. Solve the following word problems

   a. Find the volume of a box that is 12 ft wide, 5.6 ft high and 7 ft deep

   b. Find the volume of a sphere that has a radius of 7 in

c. The perimeter of a square is 102 meters. Find the length of the sides

d. The circumference of a circle is 26π centimeters. Find the radius

e. Find the cross sectional area of a cylinder if the diameter is 8 inches

f. A right cylinder tank is 10 feet in diameter and is 20 feet tall. Find the volume in cubic feet.

g. A dairy milk tank is 48 inches in diameter and 8 feet tall. Determine the volume in cubic feet

h. Given the fact the volumetric fluid flow rate is typically measured in cubic feet per second (cfs) and calculated by multiplying the cross-sectional area of the pipe times the fluid velocity. Determine the cfs of water that is flowing at 1.22ft/s in a 6-inch diameter pipe.

i. You have a circuit that has 30 mA going through it and the source is 12 V. What is the total power for the circuit?

j. You have a resistor with a value of 4 kΩ and you measure 1.2 V with your multimeter, what is the current through that resistor?

k. A city water line is 9 inches in diameter. Determine the cross-sectional area of the pipe in square feet.

l. An oil pipe line has in internal diameter of 7.5 inches. Determine the cross-sectional area of the pipe in square inches

m. Given the fact there are 7.48 gallons per cubic foot (7.48g/ft3), determine the total gallons of gasoline in a storage tank that is 75 feet in diameter and 35 feet tall