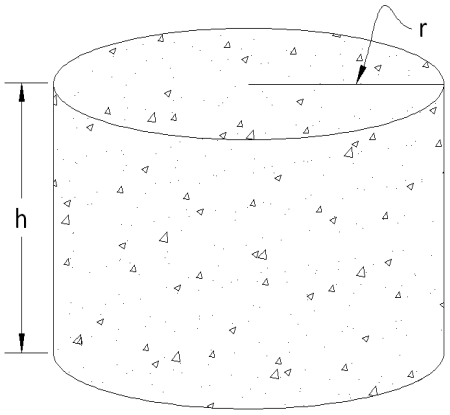
Math 085 Chapter 2 Review

- Calculators are allowed but show your steps and box your final answer.
- Include the correct unit with your answer.

1. The volume of cylindrical footing (V) is $V = \pi r^2 h$.

   H = height
   r = radius

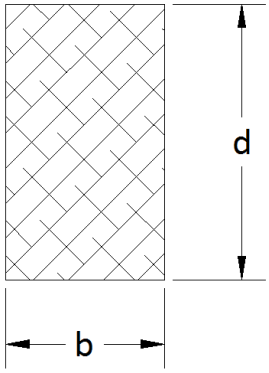
   Find the height for a cylinder with volume = 314 in^3 and radius = 6 inches. Round to one decimal place.



2. The moment of inertia (I) of a beam is $I = \frac{bd^3}{12}$.

   I = moment of inertia of the beam measured in $inches^4$
   b = width of the beam measured in inches
   d = height of the beam measured in inches

   Find the width of the beam (b) if d = 22 in and I = 3846 in^4. Round to the nearest quarter of an inch.



3. In electronics, Power (P) is $P = \frac{E^2}{R}$.

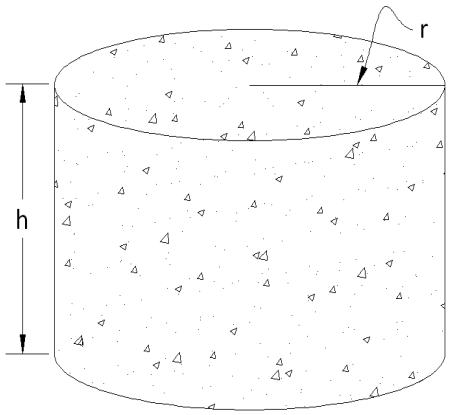
   P = power measured in watts
   R = resistance measured in ohms
   E = voltage measured in volts

   Find the voltage in a 1364 watt circuit with 12.4 ohms of resistance. Round your answer to one decimal place.

4. The volume of cylindrical footing (V) is $V = \pi r^2 h$.

   H = height
   r = radius

   Find the radius for a cylinder with volume = 296 in^3 and height = 5 inches. Round to one decimal place.



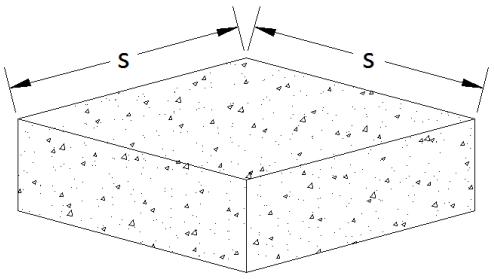
5. The formula for horsepower is $H = W\left(\frac{S}{234}\right)^3$.

   H = horsepower
   W = weight in pounds
   S = speed in MPH

   Calculate the speed for a car that weighs 2460 pounds with 440 horsepower. Round to the nearest MPH.

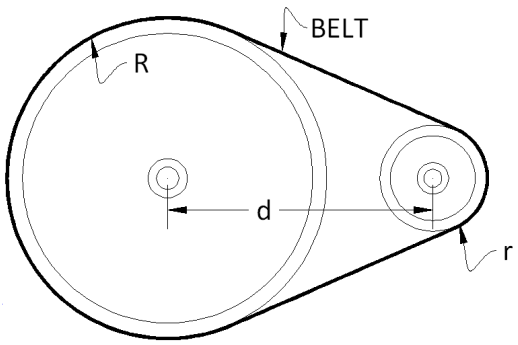
6. The formula to calculate size (S) of a square footing is $S = 12\sqrt{\frac{W}{B}}$.

   S = size of the footing measured in inches
   W = weight on the footing measured in pounds
   B = soil bearing capacity measured in pounds per square foot (PSF)



   Find the bearing capacity for a footing supporting 4320 pounds if S = 27 inches. Round to the nearest PSF.

7. An approximation of the belt length (L) in a motor is $L = \pi(R + r) + 2d$.



R = radius of the larger pulley
r = radius of the smaller pulley
d = distance between the pulleys

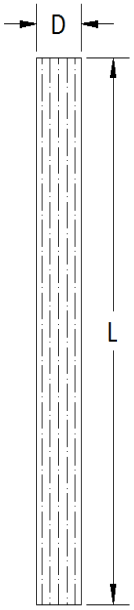
Find the radius of the larger pulley if the length of the belt is 132 inches, r = 7 inches, and d = 24 inches. Round to the nearest inch.

8. The reactance offered by a capacitor in electronics is $X = \frac{1}{2\pi fC}$.

X = reactance measured in ohms
f = frequency measured in cycles per second (hertz)
C = capacitor size measured in farads

Find the frequency in a circuit with a capacitor size of .00021 farads and a reactance of 13 ohms. Round to one decimal place.

9. The allowable stress (S) on a post is $S = \frac{3ED^2}{10L^2}$.



S = allowable stress measured in pounds per square inch (PSI)
D = dimension of the post measured in inches
L = length of the post measured in inches
E = elasticity of the beam measured in pounds per square inch (PSI)

Find the length (L) for a 5.5 inch wide post with 2180 PSI of stress, if E = 2,000,000 psi. Round to the nearest inch.

10. In electronics, Power (P) is $P = RI^2$. Solve the electronics formula for I.

11. In electronics, Power (P) is $P = \frac{E^2}{R}$. Solve the electronics formula for R.

12. The formula to calculate size (S) of a square footing is $S = 12\sqrt{\frac{W}{B}}$. Solve the construction formula for B.

13. The reactance offered by a capacitor in electronics is $X = \frac{1}{2\pi fC}$. Solve the electronics formula for f.

14. The volume of cylindrical footing (V) is $V = \pi r^2 h$. Solve the construction formula for r.

15. The moment of inertia (I) of a beam is $I = \frac{bd^3}{12}$. Solve the construction formula for d.