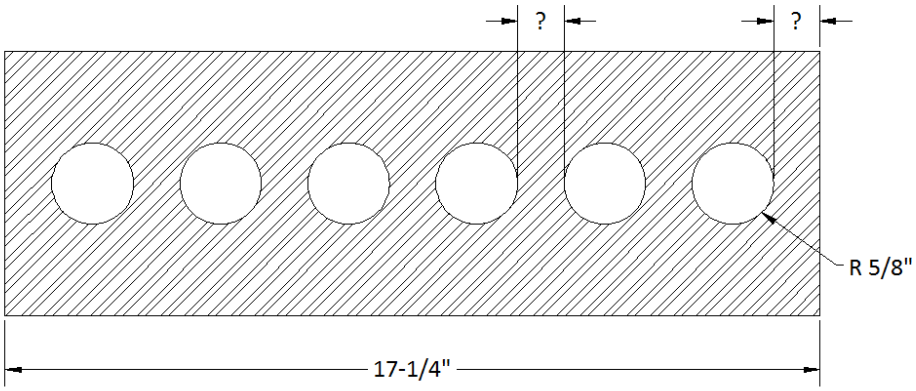
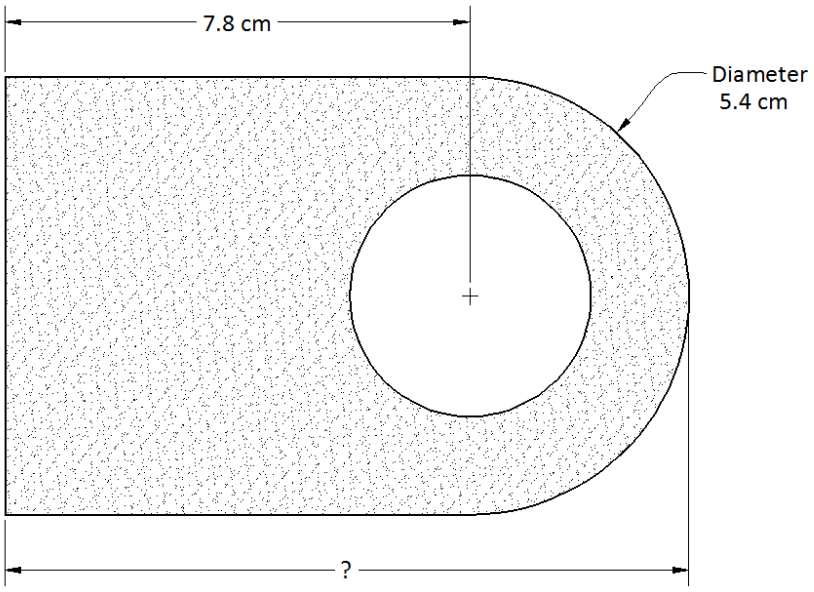
Math 085 Chapter 1 Review

Calculators are allowed but show your steps and box your final answer.

1. A plate is to have 6 evenly spaced holes. Calculate the gap rounded to the nearest 16^{th} of an inch.

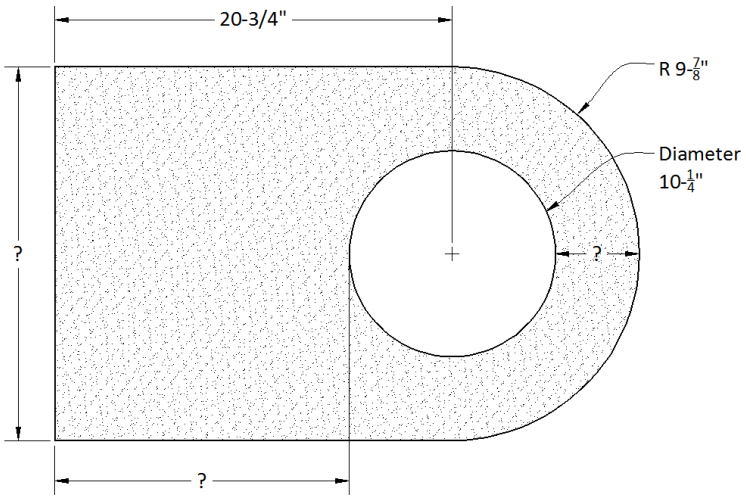


2. Calculate the width of the part below.

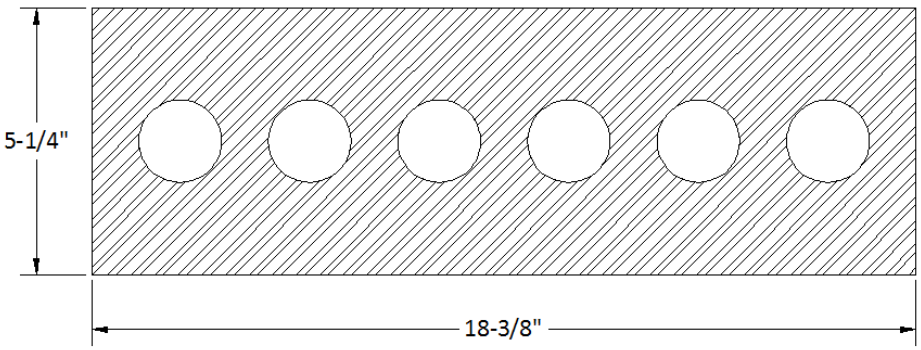


3. Calculate the dimensions of the part above if it is scaled down by 28%.

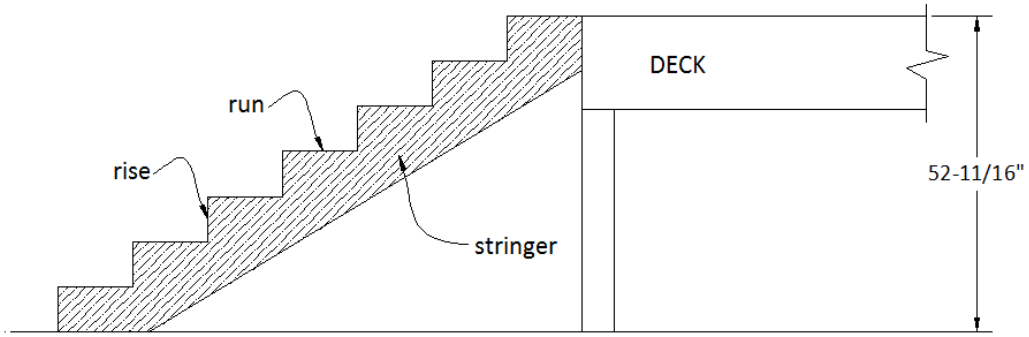
4. Calculate the 3 missing dimensions in the part.



5. Calculate the new dimensions for the part if it is scaled up by a multiple of 9.

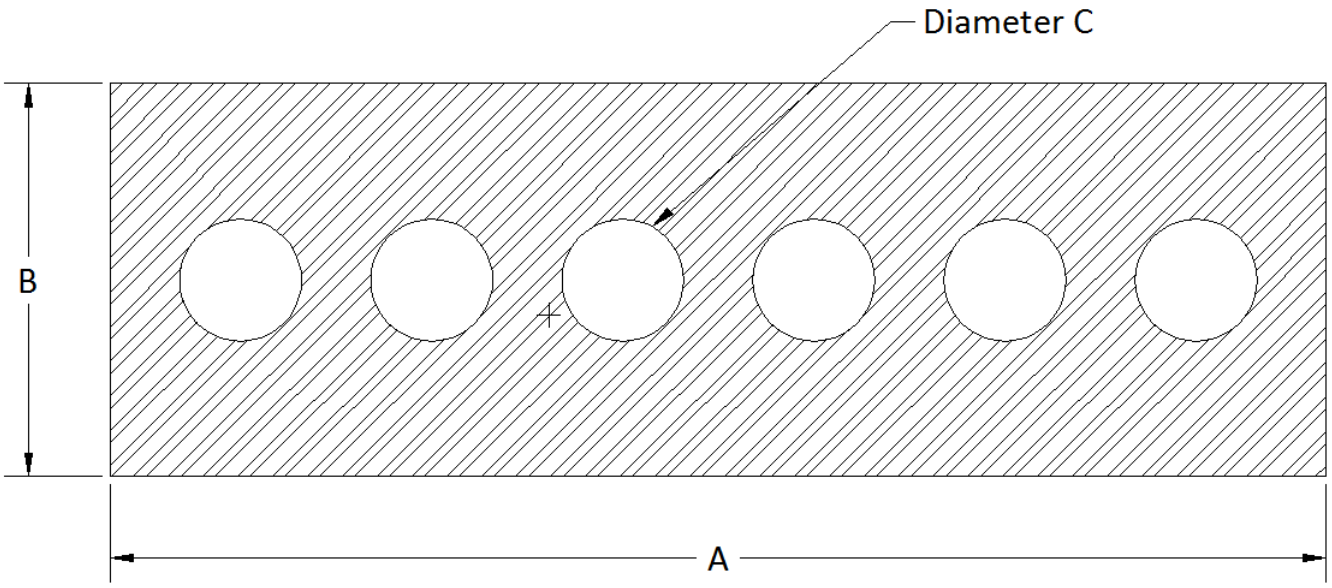


6. Calculate the height of each rise for the stair stringer rounded to the nearest 16th of an inch. Note: all the rises must be the same size to meet building code requirements.

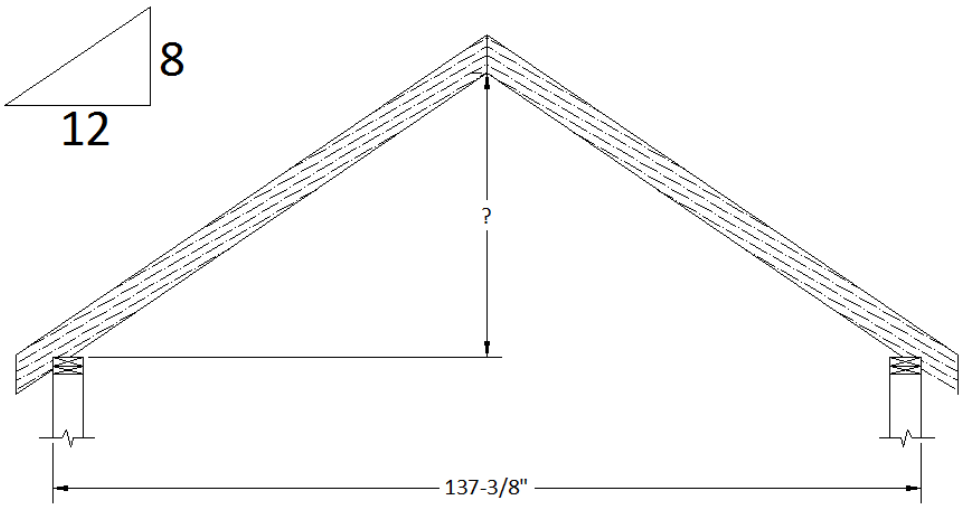


7. Measure the dimensions of the part in inches rounded to the nearest 16^{th} and in centimeters rounded to one decimal place.

Dimension	Inches	centimeters
A		
B		
Diameter C		



8. Use a proportion to calculate the height (rise) of the roof rounded to the nearest 16^{th} of an inch.



9. Convert an area of 36 square inches (in^2) to square centimeters (cm^2) rounded to 1 decimal place.

10. A (3 in x 7 in x 43 in) bar of zinc is 903 cubic inches (in^3). Calculate its weight in kilograms if zinc weighs .253 oz/ cm^3. Rounded to the nearest kilogram.

11. Convert a volume of 214 cubic feet (ft^3) to cubic meters (m^3) rounded to 1 decimal place.

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

    H = height and r = radius. Find the volume rounded to one decimal place, if h = 13" and r = 7".

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

X = reactance measured in ohms, f = frequency measured in cycles per second (hertz), C = capacitor size measured in farads. Find the reactance for a capacitor in a circuit with a frequency of 80 hertz and a capacitor size of .00054 farads, rounded to three decimal places.

14. The formula for speed is $S = 234\left(\frac{H}{W}\right)^{.333}$.

H = horsepower, W = weight in pounds, and S = speed in MPH. Calculate the speed for a car that weighs 1986 pounds with 685 horse power, rounded to the nearest MPH.

15. The voltage drop in an electrical wire is $V = \frac{2LIR}{1000}$.

V = voltage drop measured in volts, L = length of the wire measured in feet, I = current measured in amps and R = resistance in the wire measured in ohms. Use the table at the right to determine the voltage drop in a 176 foot #14 AWG electrical cord attached to a saw drawing 12 amps of current. Round to one decimal place.

AWG	R
16	4.884
14	3.072
12	1.932
10	1.215
8	.764
6	.481
4	.302

16. The point load deflection (D) of a beam is $D = \frac{PL^3}{48EI}$.

D = deflection measured in inches, P = weight on the beam measured in pounds, L = length of the beam measured in inches, E = elasticity of the beam measured in pounds per square inch (PSI), and I = moment of inertia of the beam measured in inches^4. Find the deflection of a beam rounded to one decimal place if L = 312, P = 3650,E = 1,900,000, and I = 378.

17. The length of a rafter (R) can be calculated using the formula: $R = \frac{W}{2}\sqrt{S^2 + 1}$.

R = length of the rafter measured in inches, W = width of the building measured in inches, and S = slope of the roof. Find the length of a rafter for a building that is 286" wide and has a slope of 9/12, rounded to the nearest 16th of an inch.

18. The Exhaust Header Tubing Length (L) is $L = \frac{1900D}{d^2R}$.

    L = length measured in inches, D = displacement measured in cubic inches, d = exhaust head diameter measured in inches, and R = revolutions per minute (RPM). Find L, if D = 320 in^3, d = 4 in, and R = 2600 RPM's, rounded to the nearest inch.