

Homework Examples – Mathematical Boot Camp

Show all of your work, when possible.

Scientific notation

- Express the number 9324000.0 in scientific notation (with only three significant figures)
 $= 9.23 \times 10^6$
- Express the number 2743.322 in scientific notation (with only two sig. figures)
 $= 2.7 \times 10^3$
- Express the number 0.0263 in scientific notation (with only two sig. figs)
 $= 2.6 \times 10^{-2}$
- Express the number 6.53×10^4 in decimal notation
 $= 65300.$

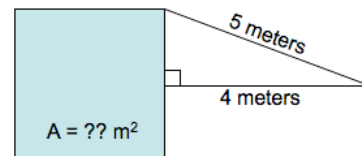
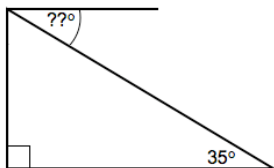
Algebra

Solve for x in each of the following equations:

- $6x - 12 = 18$
 $6x = 18 + 12 = 30 \rightarrow x = 30/6 = 5 \rightarrow x = 5$
- $3(x + 9) = 45$
 $(x + 9) = 45/3 = 15 \rightarrow x = 15 - 9 = 6 \rightarrow x = 6$
- $A(x + B)^2 = C$
 $(x + B)^2 = C/A \rightarrow (x + B) = \text{Sqrt}(C/A) = (C/A)^{(1/2)} \rightarrow x = \text{Sqrt}(C/A) - B$
- $6(x + 1)^5 = 354294$
 $(x + 1)^5 = 354294/6 = 59049 \rightarrow (x + 1) = 59049^{(1/5)} = 9 \rightarrow x = 9 - 1 = 8$

Geometry

- What is the unknown angle in the figure below/left? (in degrees)
Third internal angle is $180 - 35 - 90 = 55^\circ$?? = $90 - 55 = 35^\circ$ (also could note that it's two parallel lines intercepted by another line, so it's symmetrical)
- What is the surface area of the square below/right? (in square-meters)
Pythagorean thrm gives third triangle side: $x^2 + 4^2 = 5^2 = 25 \rightarrow x^2 = 25 - 16 = 9 \rightarrow x = 3$
Side of square is $2x = 6$ meters. Area of square is $(6\text{m})^2 = 36 \text{ m}^2 = A$



Unit Conversion

- Convert your age (rounded) from years into:
 - Days
 $21 \text{ years} \times (365 \text{ days}/1 \text{ year}) = 7665 \text{ days}$
 - Minutes
 $7665 \text{ days} \times (24 \text{ hr}/1 \text{ day}) \times (60 \text{ min}/1 \text{ hr}) = 11,037,600 \text{ min}$
- Convert your age from years into presidencies (assuming one presidency is equivalent to 4 years)
 $21 \text{ years} \times (1 \text{ presidency}/4 \text{ years}) = 5.25 \text{ presidencies}$
- Convert your age from minutes into heartbeats (assuming you've gotten a constant 65bpm (beats per minute) your whole life).
 $11,037,600 \text{ min} \times (65 \text{ beats}/1 \text{ min}) = 717,444,000 \text{ beats}$