Physics 11 - Mathematics warm-up

Part 1 solve for x in equations for the expression below, | **SOLVE FOR x** |

1) $3 = 5 + x$

2) $6 = -2x + 4$

3) $4 - 5x = 14$

4) $5 = \dfrac{x}{2}$

5) $9 = \dfrac{18}{x}$

6) $4 = \dfrac{16}{x + 2}$

Part 2   Solve for the unknown variable indicated:

1) $\dfrac{x}{9} = \dfrac{8}{20}$ **find x**

2) $E_p = mgh$ **if** $E_p = 1225$ $g = 9.8$ $h = 305$ **find m**

3) $E = mc^2$ **if** $m = 50,$ $c = 300$ **find E**

4) $E_k = \dfrac{1}{2} mv^2$ **if** $m = 4,$ $v = 22$ **find E_k**
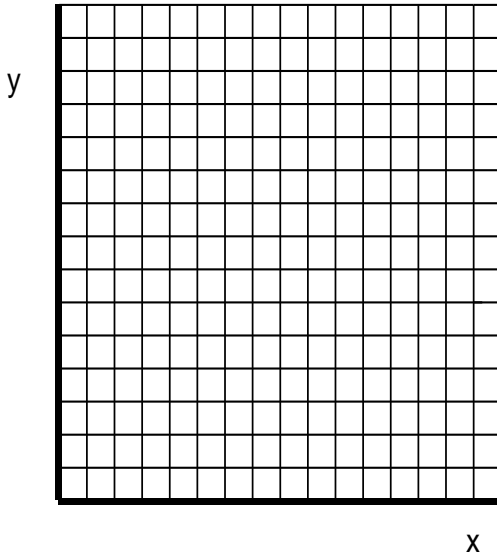
5) $d = v_i t + \dfrac{1}{2} at^2$ **if** $d = 12$ $t = 2.1$ $a = -4.3,$ **find v_i**

6) $v_f^2 = v_i^2 + 2ad$ **if** $v_f = 13.7,$ $a = -2.25,$ $d = 154$ **find v_i**

Graphing

Graph the following data on the graph below:

X	1.2	2.2	3.3	4.2	5.3	6.2	7.4
Y	3.5	4.4	5.6	6.4	7.3	8.3	9.2

y

x

- *Plot the points given.*

- *(Draw a "**line of best fit**" through the points).*

a) Determine the **slope** of the line from the graph

b) Using the graph estimate the **y-intercept**.

c) Using the formula $y=mx+b$, write the equation for the line on the graph (where m = *slope of the* line and b *is the y-intercept*)

Unit conversions – look them up if you have to

1)   3500 m into km   1)_____

2)   2.4 hours into seconds   2) _____

3)   4 cm into meters   3) _____

4)   178 cm into meters   4) _____

5)   22.3 meters/second into km/hr   5) _____

Convert the following into **scientific notation** or back to standard form
(leave this one if your not sure how to do it…We will cover it tomorrow).

6)   43126   6)_____

7)   .0042   7)_____

8)   700000   8)_____

9)   0.0000150   9)_____

10)   7.5 x 10^3 10)_____

11)   9.70 x 10^{-4} 11)_____

12)   5.16 x 10^{-5} 12)_____

Round the following to the number of figures shown

13)   6.349   round to 2 decimal places   13)_____

14)   1.03433   round to 2 decimal places   14)_____

15) **Trigonometry**: Find the missing side using the angle and side given:
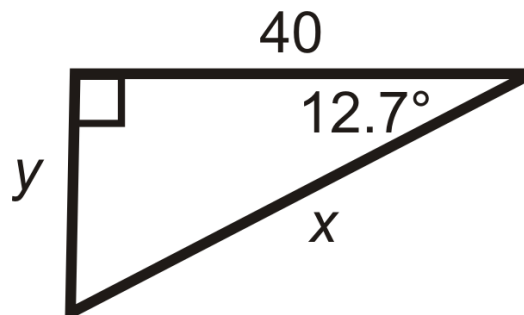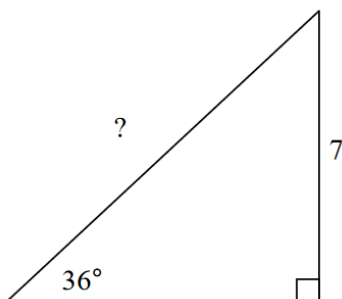
16) Find the length of the **missing** side using **Pythagorean Theorem:**

20

10

?

8 cm

6 cm

10 in

6 in

b
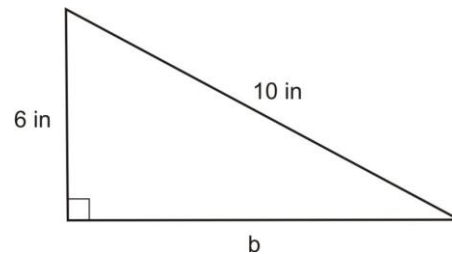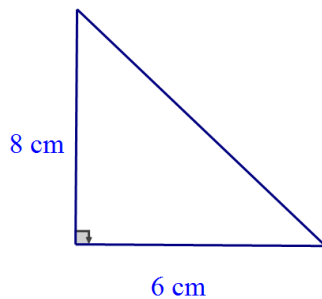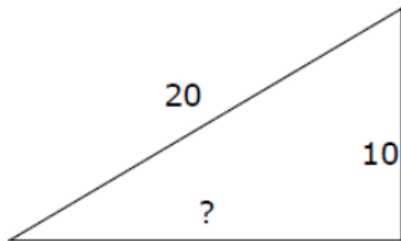
These next ones are ***very challenging*** – only try them *if* you want a challenge and have the time!

$$F_g = \frac{Gm_1m_2}{r^2}$$ $G = 6.67 \times 10^{-11}$, $m_1 = 3.45 \times 10^{16}$, $m_2 = 1.34 \times 10^7$, $F_g = 1.26 \times 10^4$, ***find r***

$$L = L_0\sqrt{1 - \frac{v^2}{c^2}}$$ $L = 13.0$, $v = 2.1 \times 10^8$, $c = 3.0 \times 10^8$, ***find L_0***

$$m = \frac{m_0}{\sqrt{1 - \frac{v^2}{c^2}}}$$ $m = 2.5 \times 10^6$, $m_0 = 2.2 \times 10^6$, $c = 3.0 \times 10^8$, ***find v***

$$N_1 sin\theta_1 = N_2 sin\theta_2$$ $N_1 = 1.35$, $N_2 = 1.04$, $\theta_1 = 24$, ***find θ_2***