

St. Edmund Preparatory High School

Science Department

All students that will be taking Physics Regents in 2019/2020 are required to complete this assignment. Answer all questions. In the spaces provided, clearly indicate the necessary steps. You may use a calculator. Students will be tested on this material in September.

Convert the following numbers into scientific notation.

1. 3,400 _____
2. 0.000023 _____
3. 101,000 _____
4. 0.010 _____
5. 45.01 _____
6. 0.00671 _____
7. 4.50 _____

Convert the following numbers into standard notation.

1. 2.3×10^4 _____
2. 1.76×10^{-3} _____
3. 1.901×10^{-7} _____
4. 8.65×10^{-1} _____
5. 9.11×10^3 _____
6. 1.98×10^0 _____
7. 5.4×10^1 _____

Convert.

1 a. 2,000 m = _____ km

1 b. 9 km = _____ m

2 a. 9,000 ml = _____ L

2 b. 3 kg = _____ g

3 a. 6 L = _____ ml

3 b. 90 mm = _____ cm

4 a. 6 cm = _____ mm

4 b. 4 km = _____ m

5 a. 1,000 m = _____ km

5 b. 2,000 g = _____ kg

6 a. 50 mm = _____ cm

6 b. 400 cm = _____ m

7 a. 4 L = _____ ml

7 b. 3 km = _____ m

8 a. 10,000 g = _____ kg

8 b. 2 cm = _____ mm

9 a. 10,000 m = _____ km

9 b. 9,000 g = _____ kg

10 a. 4,000 g = _____ kg

10 b. 8,000 ml = _____ L

Prefixes for Powers of 10		
Prefix	Symbol	Notation
tera	T	10^{12}
giga	G	10^9
mega	M	10^6
kilo	k	10^3
deci	d	10^{-1}
centi	c	10^{-2}
milli	m	10^{-3}
micro	μ	10^{-6}
nano	n	10^{-9}
pico	p	10^{-12}

1. 123,456,789 nm = _____ m

2. 99,000 μ L = _____ L

3. 777,000,777,000 pg = _____ g

4. 1,000 g = _____ pg

5. 5 L = _____ nL

6. 12,000 m = _____ μ m

7. .0008 km = _____ pm

8. 12 dL = _____ nL

Solve:

1. $-10 = 5.7 + z$	2. $2.9 = \frac{f}{6}$
3. $-24a + 26 = -21$	4. $(4 \times 10^4)(8.03 \times 10^3) =$
5. $-4 + \frac{3}{5}r = -6$	6. $\frac{25-v}{9} = 12$
7. $\frac{3.5 \times 10^{-3}}{5.25 \times 10^{-6}} =$	8. $-21.5 = 5.5(6a - 7.5)$
9. $\frac{1}{12} + \frac{1}{6} + \frac{1}{8} = \frac{1}{x}$	10. $8z + 9 + 4z = 23$
11. $-7(4f + 9) = 24$	12. $(3.8 \times 10^3)^{-2}$
13. $-23 = 10(-2 - 5w) + 50w$	14. $8(a - 6) = -48 + 8a$

Solve the following word problems.

1. An electric light bulb operates for 1 hour and 15 minutes. What is the total time the light bulb operates in seconds?

2. A block is displaced a vertical distance of 0.75 meter as it slides down a 1.25 meter long plane inclined to the horizontal.
 - a. Calculate the horizontal displacement of the block.

 - b. Calculate the angle the plane makes with the horizontal.

3. Safety guidelines recommend an area of 5.6 meters^2 per student in a laboratory setting. Would a room having dimensions of 13.2 meters and 10.6 meters accommodate 24 students and comply with these guidelines?

4. If m represents mass in kg, v represents speed in m/s, and r represents radius in m, show that the force F in the formula $F = \frac{mv^2}{r}$ can be expressed in the unit $kg \cdot m/s^2$.