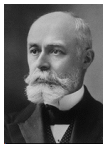
PHYSICS 534

ANSWERS

EXERCISE-04 **Math Review**



Antoine Becquerel was awarded the Nobel prize in physics in 1903 for his work on spontaneous radioactivity.

BECQUEREL

1. Express each of the following numbers in standard scientific notation:
↳ ***Note***: Standard scientific notation: #.## x $10^{\#\#}$

a) 0.000 000 000 067 9 — **6.79×10^{-11}**

b) -0.000 000 052 — **-5.2×10^{-8}**

c) 2 700 000 000 000 — **2.7×10^{12}**

d) -3 600 000 — **-3.6×10^{6}**

2. State the keys to be pressed on a scientific calculator to calculate the following:

a) $\sqrt{12^2 + 8^2}$ — ***Answer***: **14.42**

b) $3.8 \times 10^{-4} - 2.6 \times 10^{3}$ — ***Answer***: -2.60×10^{3}

c) $\dfrac{(6.67\times10^{-11})(8\times10^{5})(6\times10^{4})}{(3.2\times10^{-3})^{2}}$ — ***Answer***: 3.13×10^{5}

6 · 6 7 Exp +/- 1 1 x 8 Exp 5 x 6 Exp 4 ÷ 3 · 2 Exp +/- 3 x^2 =

3. Using a scientific calculator, calculate the result of the following and express your answers in the standard scientific notation shown above:

a) $7.5 \times 10^{3} + 9.2 \times 10^{7}$ — **9.2×10^{7}**

b) $-8.2 \times 10^{12} - 6.2 \times 10^{-23}$ — **-8.2×10^{12}**

c) $\dfrac{(9.2\times10^{13})(-5.7\times10^{-6})}{3.5\times10^{-19}}$ — **-1.5×10^{27}**

d) $\dfrac{(-2.2\times10^{-3})(9.5\times10^{-7})}{-1.5\times10^{-15}}$ — **1.40×10^{6}**

4. $\dfrac{(71\,500\,000)(0.000\,000\,875)}{(0.001\,25)^2}$ **4.00 x 10^{7}**

5. $\dfrac{(7.52\times10^{7})(8.32\times10^{-5})}{(1.45\times10^{-3})^2}$ **2.98 x 10^{9}**

6. $\dfrac{3.14(8.27\times10^{3})^2}{(6.25\times10^{7})^2}$ **5.50 x 10^{-8}**

7. $(4 \times 10^{21})(5 \times 10^{-13})$ **2.00 x 10^{9}**

8. $\dfrac{(1.2\times10^{-15})(4.8\times10^{22})}{(4.8\times10^{-6})(2.5\times10^{-16})}$ **4.80 x 10^{28}**

9. Find x: $\dfrac{x}{0.000\,025}=\dfrac{7.8\times10^{7}}{5.1\times10^{4}}$ **3.82 x 10^{-2}**

10. 125 Sin 34^{o} **69.9**

11. (67.8 Sin 50^{o})(29.5 Cos 25^{o}) **1.39 x 10^{3}**

12. $\sqrt{25^2+14^3}$ **58**

13. 4.52 + 6.23 x 10^{3} - 2.2 x 10^{2} **6.01 x 10^{3}**

14. Fill in the blanks below with the word *quotient* or *product*:

Two quantities vary **directly** if their **quotient** is a constant

and **inversely** if their **product** is a constant.

15. Give an example of a **direct** and an **indirect** relationship:

Answers will vary.