**Math Diagnostic Test for NCEA L2 Physics** NAME:

**Graphs**

1. Which of these lines below has the largest gradient (slope)? A B C D

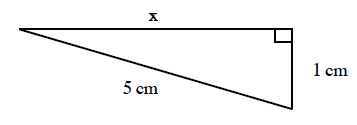
|  |  |  |  |
| --- | --- | --- | --- |
| http://condor.depaul.edu/jmilton/mathd/1a.jpg | http://condor.depaul.edu/jmilton/mathd/1b.jpg | http://condor.depaul.edu/jmilton/mathd/1c.jpg | http://condor.depaul.edu/jmilton/mathd/1d.jpg |

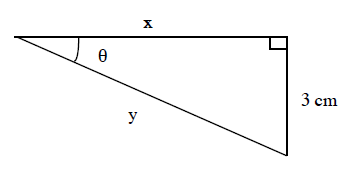
2. Which (one or more) of these graphs represent(s) a direct proportion? A B C D

|  |  |  |  |
| --- | --- | --- | --- |
| http://condor.depaul.edu/jmilton/mathd/2a.jpg | http://condor.depaul.edu/jmilton/mathd/2b.jpg | http://condor.depaul.edu/jmilton/mathd/2c.jpg | http://condor.depaul.edu/jmilton/mathd/2d.jpg |

3.  Which (one or more) of the graphs in question 2 represent(s) a **linear** function? A B C D

**Trigonometry** (solve for x – show full working in the space opposite each question)

4. 

5. 

θ = 40o

**Scientific Notation**

In scientific work, it is convenient to express numbers as the product of a number between 1 and 10 multiplied by an appropriate power of 10. Thus 0.00050 becomes 5.0 x10-4 and 1,800,000 is written as

1.8 x106. This way of writing numbers is called scientific (or powers of ten) notation.

Carry out the operations indicated and **express the results in scientific notation**.

6. 2 x 0.000015 = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7. (0.00002)3 = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

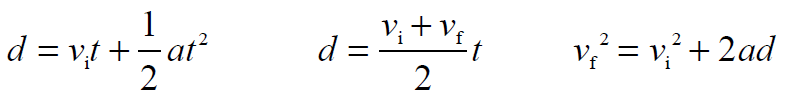
8. (4x108) x (9x109) = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

9. (3x107) x (6x10-12) = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Algebra** (show full working in space provided for each question)

solve for x solve for x

10. 5x -7 = 11 11. 3 (x-5) = 12



12. Solve for d:

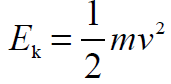
vi = 8 ms-1

vf = 0

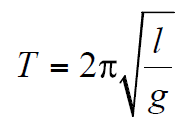
d = ?

a = ?

t = 12 s



13. A ball has 28 J of Kinetic energy (Ek). If it has a mass of 10g, calculate the ball’s speed (v)



14. Given that , write an expression which contains only g on the left-hand side, ie g = ?