KEY

# Review for Introductory Unit (No Vectors)

1.) State the number of significant digits in each of the following:

a.) 1000 1 b.) $1.00 \times 10^3$ 3 c.) 1000.0 5 d.) 0.001 1

e.) 0.101 3 f.) 743 3 g.) 0.7040 4 h.) – 70.0 3

i.) $7.00 \times 10 - 7$ 3 j.) 7.005 4

2.) Write the following in scientific notation.

a.) 4007900 b.) $-0.000\ 000\ 000\ 164$ c.) – 70.94 d.) 742.39

$4.0079 \times 10^6$ $-1.64 \times 10^{-10}$ $-7.094 \times 10^1$ $7.4239 \times 10^2$

e.) 0.0062 f.) 700000

$6.2 \times 10^{-3}$ $7.\times 10^5$

3.) Calculate the following, express your answer in scientific notation with the correct significant figures.

a.) $0.00614 \times 3200 =$ b.) $-4210 \div 0.0640 =$

$2.0 \times 10^1$ $-6.58 \times 10^4$

c.) $48 \times \frac{9600}{2.00^5} =$ c.) $0.0614 \times \pi =$

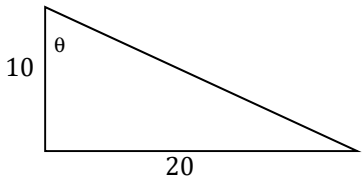
$1.4 \times 10^4$ $1.93 \times 10^{-1}$

e.) $96.3 - 0.62 =$ f.) $78.4 + 1.002 =$

$9.57 \times 10^1$ $7.94 \times 10^1$

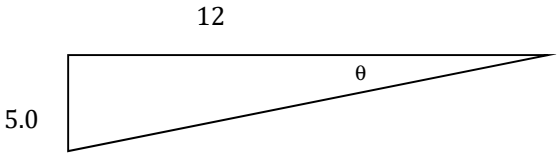
4.) Calculate the unknown angles

a.)



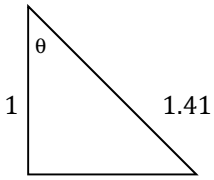

$tan\ \theta = \frac{20}{10}$ $\theta = 63.4°$ $\theta = 60°$

b.)



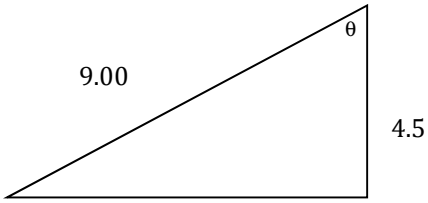

$tan\ \theta = \frac{5}{12}$ $\theta = 22.6°$ $\theta = 23°$

c.)




$\cos\theta = \frac{1}{1.41}$ $\theta = 44.8°$ $\theta = 40°$

d.)




$\tan\theta = \frac{4.5}{9.00}$ $\theta = 60.0°$ $\theta = 60.°$

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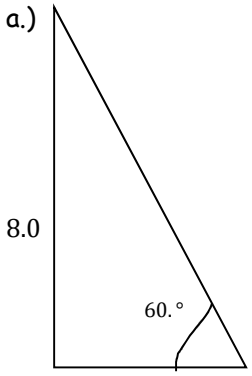
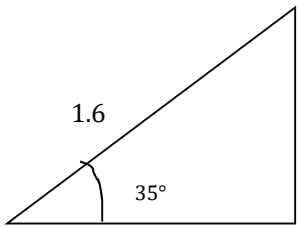
5.) Calculate the unknown sides in the triangles below.

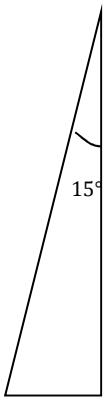
a.)




b.)




c.)




75

a.) $sin\ 60° = \frac{8.0}{x}$ $x = 9.24$ $x = 9.2$ b.) $sin\ 35° = \frac{x}{1.6}$ $x = 0.918$ $x = 0.92$ c.) $sin\ 15° = \frac{75}{x}$ $x = 290$ $x = 290$

a.) $\tan\theta = \frac{8.0}{y}$ $y = 4.62$ $y = 4.5$ b.) $\cos 35° = \frac{y}{1.6}$ $y = 1.31$ $y = 1.3$ c.) $tan\ 75° = \frac{75}{y}$ $y = 280$ $x = 280$

6.) Solve the following equations for the variable listed.

a.) solve for $\vec{F}$

$\frac{\vec{F}}{m} = \vec{a}$

$\vec{F} = m\vec{a}$

b.) solve for I

$\vec{v} = \mathcal{E} + IR$

$I = \frac{\vec{v}-\varepsilon}{R}$

c.) solve for $\vec{V_o}$

$\vec{v_f}^2 = \vec{v_o}^2 + 2ad$

$\vec{v_o} = \sqrt{\vec{v_f}^2 - 2\vec{a}\vec{d}}$

d.) solve for v

$\frac{\vec{v}^2}{r} = \frac{4\pi^2 r}{t^2}$

$\vec{v} = \frac{2\pi r}{T}$

e.) solve for $d_i$

$\frac{1}{f} = \frac{1}{d_i} + \frac{1}{d_o}$

$d_i = f - d_o$

f.) solve for g

$E = mgh$

$g = \frac{E}{mh}$

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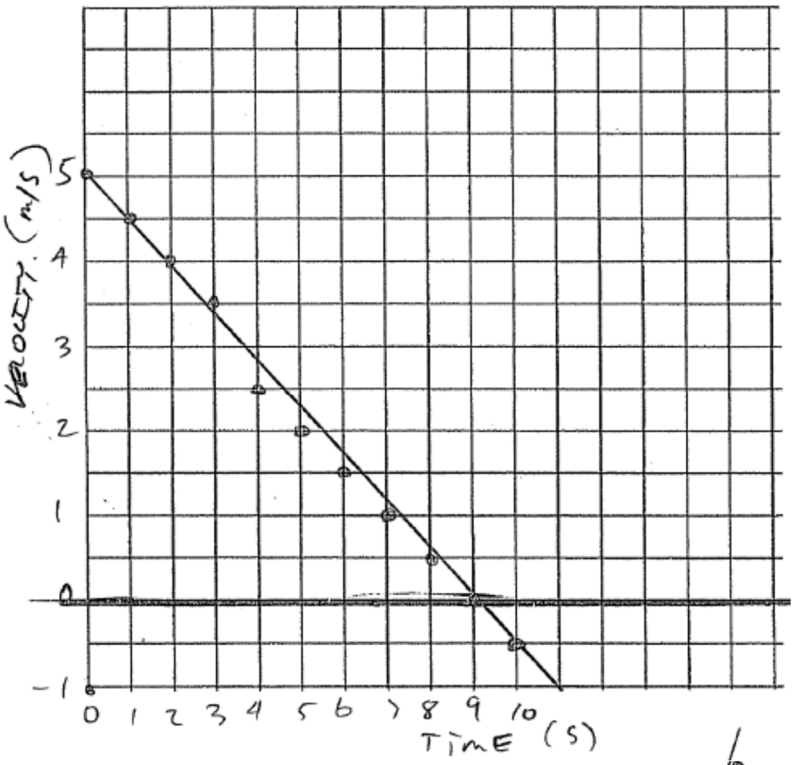
7.) Plot, graph, state the shape of the curve and develop an equation for the following data:

a.) $m = \frac{y_2 - y_1}{x_2 - x_1}$ $m = \frac{0-5}{9-0}$ $m = -\frac{5}{9}$ $y = -\frac{5}{9} + 5$

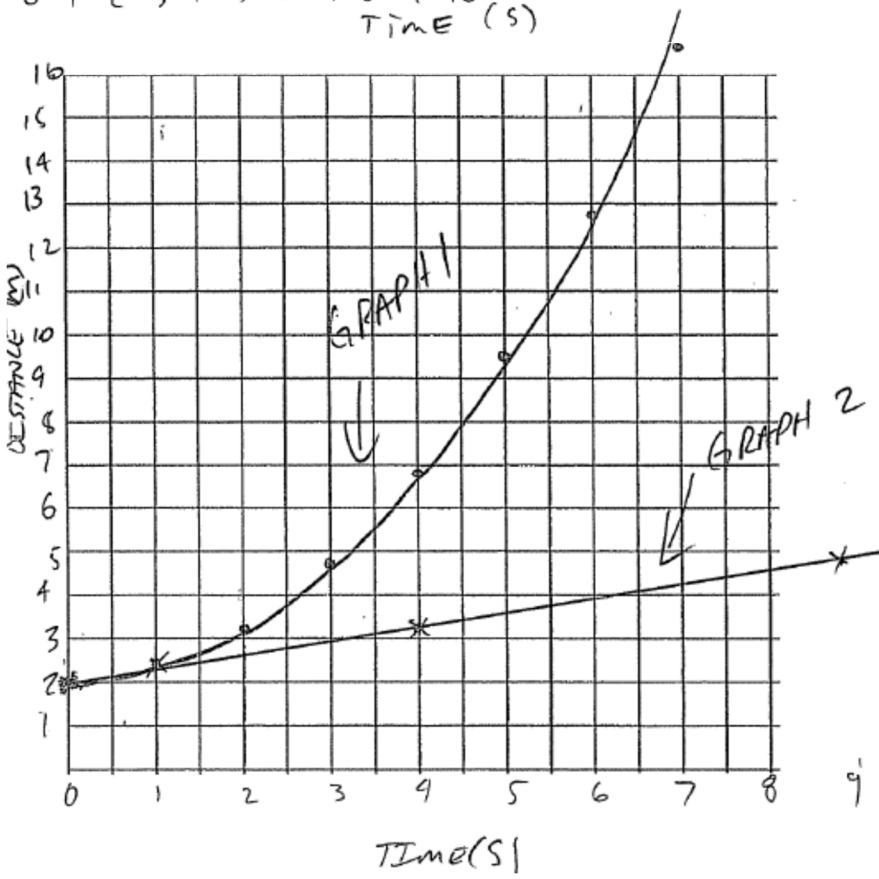
| $Time\ (s)$ | $Velocity\ (\frac{m}{s})$ |
|---|---|
| 0 | 5 |
| 1 | 4.5 |
| 2 | 4.0 |
| 3 | 3.5 |
| 4 | 2.5 |
| 5 | 2.0 |
| 6 | 1.5 |
| 7 | 1.0 |
| 8 | 0.5 |
| 9 | 0 |
| 10 | −0.5 |




Linear negative

b.)

| $Time\ (s)$ | $Distance\ (m)$ | $Time^2 (s^2)$ |
|---|---|---|
| 0 | 2.0 | 0 |
| 1 | 2.3 | 1 |
| 2 | 3.2 | 4 |
| 3 | 4.7 | 9 |
| 4 | 6.8 | 16 |
| 5 | 9.5 | 25 |
| 6 | 12.8 | 36 |
| 7 | 16.7 | 49 |




$d = 0.3t^2 + 2$ $d = \frac{3}{10}t + 2$

Exponential linear

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8.) Add a column to the distance – time table above for $(time)^2$, then graph $d\ vs. t^2$ on the grid below. Find the slope.

See graph #2 on previous Page.