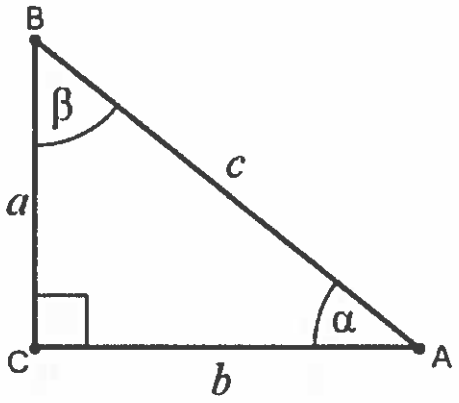
Quiz #1 Name:_____ Date: KEY

NOTE: Show your work please. /20

[2] 1. If $\beta = 30°$ and $c = \sqrt{2}$ what is the length of the sides a and b?



$a = \cos(\beta) \cdot c$
$= \cos(30°) \cdot \sqrt{2}$
$= 1.2$ units

$b = \sin(\beta) \cdot c$
$= \sin(30°) \cdot \sqrt{2}$
$= 0.71$ units

[8] 2. Convert the following and use scientific notation with 3 significant digits:

a) 5067 km/h, (m/s) $= \frac{5067\ km}{h} \times \frac{1000\ m}{1\ km} \times \frac{h}{3600\ s} = 1.41 \times 10^{3} \frac{m}{s}$

b) 38.04 m/s, (km/h) $= \frac{38.04\ m}{s} \times \frac{1\ km}{1000\ m} \times \frac{3600\ s}{1\ h} = 1.37 \times 10^{2} \frac{km}{h}$

c) 1000 µg, (g) $= 1.00\ mg = 1.00 \times 10^{-3}\ g$

d) 0.0530 kg (mg) $= 53.0\ g = 5.3 \times 10^{4}\ mg$

[7] 3. When will the ball that was dropped from the height of 20 m reach the ground? What assumptions do you make?

- free fall

$$\vec{\Delta d} = \vec{v_i}\Delta t + \frac{1}{2}\vec{a}\Delta t^2$$

$$-20 = 0 + (-4.9)\Delta t^2$$

$$\Delta t = \pm\sqrt{\frac{-20}{-4.9}}$$

$$\Delta t = 2.02\ s$$

∴ The ball will reach the ground after 2.02 s

[3] 4. Isolate for initial velocity from the kinematic formula $v_f^2 = v_i^2 + 2ad$

$$\vec{v_f}^2 = \vec{v_i}^2 + 2\vec{a}d$$

$$v_f^2 - 2ad = v_i^2$$

$$v_i = \pm\sqrt{v_f^2 - 2ad}$$