Notes for Quiz

Pendulums:

$$T = 2\pi\sqrt{\frac{L}{g}}$$

T = period (s)

L = length of pendulum (m)

g = gravity (m/s^2)

★ when solving for T, plug in length & gravity to solve.

★ when solving for length, plug in period & gravity. then use Algebra to solve.

Step 1: Divide by (2π)
step 2: square both sides
step 3: multiply by gravity.

★ when solving for gravity, plug in period & length.

Step 1: Divide by (2π)
step 2: square both sides.
step 3: get "g" by itself by multiplying "g", then dividing by #.

$$\frac{1\text{ s}}{(2\pi)} = \frac{(2\pi)\sqrt{\frac{l}{9.8}}}{2\pi}$$

$$(.159)^2 = \left(\sqrt{\frac{l}{9.8}}\right)^2$$

$$.0253 = \frac{l}{9.8}$$

$$\times 9.8 \qquad \times 9.8$$

$$.24\text{m} = l$$

Mass

$$T = 2\pi\sqrt{\frac{m}{K}}$$

T = period (s)

m = mass (kg)

K = spring constant (N/m)

Same type formula as the pendulum formula - follow same steps to solve for missing variables.

Doppler Effect

$$f_o = \frac{V \pm V_o}{V \mp V_s} f_s$$

f_o = frequency of observer (Hz)
f_s = frequency of source (Hz)
V = speed of sound (usually given)
V_o = velocity of observer
V_s = velocity of source

When using this formula, you must read carefully and use appropriate signs.

$$f_o = \frac{V \pm V_o}{V \mp V_s} f_s$$

when moving toward use the top signs:

$$f_o = \frac{V + V_o}{V - V_s} f_s$$

when moving away use bottom signs:

$$f_o = \frac{V - V_o}{V + V_s} f_s$$