Kinematics Equations Pop Quiz Name:

1) **Ima Hurryin is approaching a stoplight moving with a velocity of +30.0 m/s. The light turns yellow, and Ima applies the brakes and skids to a stop. If Ima's acceleration is -8.00 m/s^2, then determine the displacement of the car during the skidding process.**

2) **Ben Rushin is waiting at a stoplight. When it finally turns green, Ben accelerated from rest at a rate of a 6.00 m/s^2 for a time of 4.10 seconds. Determine the displacement of Ben's car during this time period.**

3) **Luke Autbeloe drops a pile of roof shingles from the top of a roof located 8.52 meters above the ground. Determine the time required for the shingles to reach the ground.**

4) **Rex Things throws his mother's crystal vase vertically upwards with an initial velocity of 26.2 m/s. Determine the height to which the vase will rise above its initial height.**

FORMULAS AND QUANTITIES

FORMULAS

OPTICS

$$n_1 \sin\theta_1 = n_2 \sin\theta_2$$

$$M = \frac{h_i}{h_o} = \frac{-d_i}{d_o}$$

$$M = \frac{h_i}{h_o}$$

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

MECHANICS

$$v_{av} = \frac{\Delta d}{\Delta t}$$

$$a = \frac{\Delta v}{\Delta t}$$

$$\Delta d = v_1 \Delta t + \frac{1}{2} a (\Delta t)^2$$

$$\Delta d = \frac{(v_1 + v_2)\Delta t}{2}$$

$$v_2 = v_1 + a\Delta t$$

$$v_2^2 = v_1^2 + 2a\Delta d$$

$$E_g = mgh$$

$$E_k = \frac{1}{2} mv^2$$

$$F = ma$$

$$F_g = mg$$

$$F = kx$$

$$P = \frac{W}{\Delta t}$$

$$W = F \bullet \Delta d$$

QUANTITIES

NAME	SYMBOL	VALUE
Speed of light in a vacuum	c	3.00×10^8 m/s
Acceleration due to gravity (Earth)	g	9.8 m/s^2 or 9.8 N/kg