

Putting Trig Equations to Work

Name _____

Directions: Grab your calculator and be sure to show all work.

1. *(Solve Algebraically)* When batted, a baseball leaves the bat at an angle of θ with the horizontal and an initial velocity of $v_0 = 100$ feet per second. An outfielder catches the ball 300 feet from home plate. Find θ , given that the range, R , of the projected baseball is modeled by the equation

$$R = \frac{(v_0)^2}{32} \sin 2\theta.$$



2. *(Solve Graphically)* A child is watching a small toy car, which he attached to the end of a vertically hanging slinky (a spring), bob up and down with the oscillating motion of the slinky. The position of the toy car relative to the point of equilibrium (the slinky at rest) is modeled by the equation

$$P = \frac{1}{12}(\cos 8t - 3\sin 8t)$$

where P is the displacement in meters and t is the time in seconds. Find the times when the toy car is at the point of equilibrium ($P = 0$) for $0 \leq t \leq 1$.

