

### P3.3 Arc Practice Problems

Round to the correct three figures, Ignore air friction and use the convention that down is negative.  $g = 9.80 \text{ m/s}^2$

8.45 s 149 m 87.5 m 17.6 m/s	1. A flaming projectile is launched on a level range at a speed of 45.0 m/s at an angle of $67.0^\circ$ above the horizontal. a. For how long does it stay in the air? b. What horizontal distance does it travel? c. What is its greatest height? d. What is its speed at its highest point?
6.96 s 326 m 59.3 m 46.9 m/s	2. A donut is launched on a level range at a speed of 58.0 m/s at an angle of $36.0^\circ$ above the horizontal. a. For how long does it stay in the air? b. What horizontal distance does it travel? c. What is its greatest height? d. What is its speed at its highest point?
4.59 s 22.0 m 25.8 m 4.78 m/s	3. A hazelnut is launched on a level range at a speed of 23.0 m/s at an angle of $78.0^\circ$ above the horizontal. a. For how long does it stay in the air? b. What horizontal distance does it travel? c. What is its greatest height? d. What is its speed at its highest point?
5.67 s 147 m 39.4 m 25.9 m/s	4. A 1968 VW Beetle is launched on a level range at a speed of 38.0 m/s at an angle of $47.0^\circ$ above the horizontal. a. For how long does it stay in the air? b. What horizontal distance does it travel? c. What is its greatest height? d. What is its speed at its highest point?
3.06 s 24.4 m 11.5 m 7.98 m/s	5. A soccer ball is kicked on a level range at a speed of 17.0 m/s at an angle of $62.0^\circ$ above the horizontal. a. For how long does it stay in the air? b. What horizontal distance does it travel? c. What is its greatest height? d. What is its speed at its highest point?
50.0 m 104 m 41.7 m 40.0 m 83.3 m 48.9 m	6. a) A rocket is launched at speed of 23.0 m/s at $34.0^\circ$ above horizontal. Range = ? b) A rocket is launched at speed of 32.0 m/s at $45.0^\circ$ above horizontal. Range = ? c) A rocket is launched at speed of 21.0 m/s at $56.0^\circ$ above horizontal. Range = ? d) A rocket is launched at speed of 28.0 m/s at $75.0^\circ$ above horizontal. Range = ? e) A rocket is launched at speed of 29.0 m/s at $52.0^\circ$ above horizontal. Range = ? f) A rocket is launched at speed of 22.0 m/s at $49.0^\circ$ above horizontal. Range = ?
$17.3^\circ$ $72.7^\circ$ $32.8^\circ$ $57.2^\circ$ $36.5^\circ$ $53.5^\circ$ $15.4^\circ$ $74.6^\circ$ $28.9^\circ$ $61.1^\circ$ $23.7^\circ$ $66.3^\circ$	7. a) Range = 67.0 m, velocity = 34.0 m/s, angle = ? and ? b) Range = 45.0 m, velocity = 22.0 m/s, angle = ? and ? c) Range = 61.0 m, velocity = 25.0 m/s, angle = ? and ? d) Range = 23.0 m, velocity = 21.0 m/s, angle = ? and ? e) Range = 54.0 m, velocity = 25.0 m/s, angle = ? and ? f) Range = 92.0 m, velocity = 35.0 m/s, angle = ? and ?