Name _____

47	At an Angle Projectile Problems

At an Angle Projectile Problems
Show ALL work including givens, formula, final answer and units.

$d = vt$ $v_f = v_i + at$ $d = v_i t + (1/2)at^2$ $g = 9.8 \text{ m/s}^2$
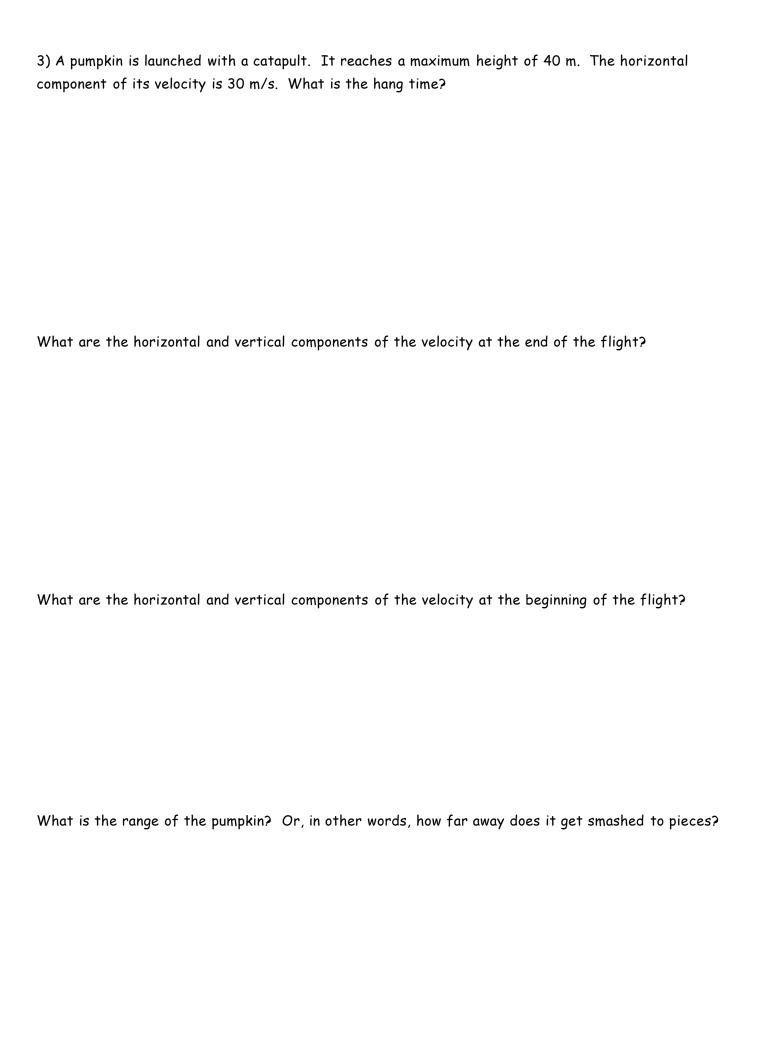
1) A football is kicked to start a game. It reaches a maximum height of 30 m. The horizontal component of its velocity is 20 m/s. What is the hang time?

What are the horizontal and vertical components of the velocity at the end of the flight?

What are the horizontal and vertical components of the velocity at the beginning of the flight?

What is the range of the football?

2) A _____(fill in a noun) was launched from the ground at an angle. Its hang time was 24 s. Its range was 125 m. What was its maximum height?

What was the vertical component of the final velocity?

What was the horizontal component of the velocity?

3) A pumpkin is launched with a catapult. It reaches a maximum height of 40 m. The horizontal component of its velocity is 30 m/s. What is the hang time?

What are the horizontal and vertical components of the velocity at the end of the flight?

What are the horizontal and vertical components of the velocity at the beginning of the flight?

What is the range of the pumpkin? Or, in other words, how far away does it get smashed to pieces?

4) A snowboarder left the snowy ground at an angle. Their hang time was 8.0 s. Their range was 120 m.

What was it's maximum height?

What was the vertical component of the final velocity?

What was the horizontal component of the velocity?

1) 2.5 x2 = 5 s <> horizontal 20 m/s vertical 24.5 m/s <> horizontal 20 m/s vertical 24.5 m/s <> 100 m   2) 706 m <> 118 m/s <> 5.2 m/s

3) 2.9 x 2 = 5.8 s <> horizontal 30 m/s vertical 28.4 m/s <> horizontal 30 m/s vertical 28.4 m/s <> 174 m   4) 78.4 m <> 39.2 m/s <> 15 m/s