**Arc Practice Problems for A3.3**

Round to the correct significant figures, Ignore air friction and use the convention that down is negative. g = 9.81 m/s/s

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| 6.53 s  36.8 m  6.11 m/s, 22.4o blw hrz | 1. A big %$# ham is launched at 32.5 m/s at an angle of 80.0o above horizontal on a level field.  a. What time is the ham in the air?  b. What horizontal distance does it travel before hitting the ground again?  c. What is its velocity as an angle and a magnitude exactly 3.50 s after it is launched? (Draw a picture of the velocity vector) |
| 10.5 s  805 m  765 m x + 25.6 m y  76.5 m/s x + -46.5 m/s y | 2. A wienerschnitzel is launched at 92.3 m/s at an angle of 34.0o above horizontal on a level field.  a. What time is the schnitzel in the air?  b. What horizontal distance does it travel before hitting the ground again?  c. At 10.0 s after launch, what are the position of the schnitzel and the velocity of the schnitzel in vector components? Write them both as proper component vectors. |
| 5.20 s  91.6 m  31.6 m x + 30.0 m y  17.6 m/s x + 7.91 m/s y  60.0 m x + 30.0 m y  17.6 m/s x + -7.91 m/s y | 3. A potato is launched at 31.0 m/s at an angle of 55.4o above horizontal on a level field.  a. What time is the ball in the air?  b. What horizontal distance does it travel before hitting the ground again?  c. When the potato reaches an elevation of 30.0 m on the way **up**, what are the position of the ball and the velocity of the potato in vector components? Write them both as proper component vectors.  d. When the potato reaches an elevation of 30.0 m on the way **down**, what are the position of the ball and the velocity of the potato in vector components? Write them both as proper component vectors. |
| 1.54 s  14.4 m  10.0 m x + 2.47 m y  9.31 m/s x + -2.97 m/s y | 4. A fruit cake is launched at 12.0 m/s at an angle of 39.1o above horizontal on a level field.  a. What time is the cake in the air?  b. What horizontal distance does it travel before hitting the ground again?  c. When the cake has covered a horizontal distance of 10.0 m, what are the position of the cake and the velocity of the cake in vector components? Write them both as proper component vectors. |
| 1.76 s  26.4 m  15.0 m/s, 3.03o abv hrz | 5. A lime is launched at 17.3 m/s at an angle of 30.0o above horizontal on a level field.  a. What time is the lime in the air?  b. What horizontal distance does it travel before hitting the ground again?  c. What is its velocity as an angle and a magnitude when it has covered a horizontal distance of only 12.0 m. (Draw a picture of the velocity vector) |
| 78.0 m/s  658 m | 6. A Toyota is launched at 92.1 m/s at an angle of 61.0o above horizontal onto the top of a 122 m tall cliff. (It lands 122 m higher in elevation)  a. What is its speed of impact?  b. What horizontal distance does it travel before hitting the ground again? |
| 6.71 s  122 m | 7. A chestnut is launched at 29.5 m/s at an angle of 52.0o above horizontal from the top of an 65.0 m tall cliff. (It lands 65.0 m lower in elevation)  a. What time is it in the air?  b. What horizontal distance does it travel before hitting the ground again? |
| 10.4 s  199 m | 8. A mango is launched at 62.1 m/s at an angle of 72.0o above horizontal onto the top of a 85.0 m tall cliff. (It lands 85.0 m higher in elevation)  a. What time is it in the air?  b. What horizontal distance does it travel before hitting the ground again? |
| 39.9 m/s  107 m | 9. A giant lizard is launched at 26.6 m/s at an angle of 28.0o above horizontal from the top of a 45.2 m tall cliff. (It lands 45.2 m lower in elevation)  a. What is its speed of impact?  b. What horizontal distance does it travel before hitting the ground again? |
| 35.9 m/s  80.1 m | 10. A flaming digital projectile is launched at 28.6 m/s at an angle of 62.0o above horizontal from the top of a 24.0 m tall cliff. (It lands 24.0 m lower in elevation)  a. What is its speed of impact?  b. What horizontal distance does it travel before hitting the ground again? |