# 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<br>36.8 m<br>6.11 m/s, 22.4$^o$ blw hrz | 1. A big %$# ham is launched at 32.5 m/s at an angle of 80.0$^o$ above horizontal on a level field.<br>a. What time is the ham in the air?<br>b. What horizontal distance does it travel before hitting the ground again?<br>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<br>805 m<br>765 m x + 25.6 m y<br>76.5 m/s x + -46.5 m/s y | 2. A wienerschnitzel is launched at 92.3 m/s at an angle of 34.0$^o$ above horizontal on a level field.<br>a. What time is the schnitzel in the air?<br>b. What horizontal distance does it travel before hitting the ground again?<br>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<br>91.6 m<br><br>31.6 m x + 30.0 m y<br>17.6 m/s x + 7.91 m/s y<br><br>60.0 m x + 30.0 m y<br>17.6 m/s x + -7.91 m/s y | 3. A potato is launched at 31.0 m/s at an angle of 55.4$^o$ above horizontal on a level field.<br>a. What time is the ball in the air?<br>b. What horizontal distance does it travel before hitting the ground again?<br>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.<br>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<br>14.4 m<br>10.0 m x + 2.47 m y<br>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 39.1$^o$ above horizontal on a level field.<br>a. What time is the cake in the air?<br>b. What horizontal distance does it travel before hitting the ground again?<br>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<br>26.4 m<br>15.0 m/s, 3.03$^o$ abv hrz | 5. A lime is launched at 17.3 m/s at an angle of 30.0$^o$ above horizontal on a level field.<br>a. What time is the lime in the air?<br>b. What horizontal distance does it travel before hitting the ground again?<br>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<br>658 m | 6. A Toyota is launched at 92.1 m/s at an angle of 61.0$^o$ above horizontal onto the top of a 122 m tall cliff. (It lands 122 m higher in elevation)<br>a. What is its speed of impact?<br>b. What horizontal distance does it travel before hitting the ground again? |
| 6.71 s<br>122 m | 7. A chestnut is launched at 29.5 m/s at an angle of 52.0$^o$ above horizontal from the top of an 65.0 m tall cliff. (It lands 65.0 m lower in elevation)<br>a. What time is it in the air?<br>b. What horizontal distance does it travel before hitting the ground again? |
| 10.4 s<br>199 m | 8. A mango is launched at 62.1 m/s at an angle of 72.0$^o$ above horizontal onto the top of a 85.0 m tall cliff. (It lands 85.0 m higher in elevation)<br>a. What time is it in the air?<br>b. What horizontal distance does it travel before hitting the ground again? |
| 39.9 m/s<br>107 m | 9. A giant lizard is launched at 26.6 m/s at an angle of 28.0$^o$ above horizontal from the top of a 45.2 m tall cliff. (It lands 45.2 m lower in elevation)<br>a. What is its speed of impact?<br>b. What horizontal distance does it travel before hitting the ground again? |
| 35.9 m/s<br>80.1 m | 10. A flaming digital projectile is launched at 28.6 m/s at an angle of 62.0$^o$ above horizontal from the top of a 24.0 m tall cliff. (It lands 24.0 m lower in elevation)<br>a. What is its speed of impact?<br>b. What horizontal distance does it travel before hitting the ground again? |