

1 Projectiles and 2D Problems

1. 8.4 m
2. a) $x = 8$ m, $y = 10.7$ m
b) $x = 10$ m, $y = 12.3$ m
c) $x = 30$ m, $y = 6.96$ m
3. 49.8 ms^{-1} , 1.9° (below)

2 Motion under Constant Acceleration

1. 34.6 m
2. 6.57 m
3. 23.9 ms^{-1}
4. Yes; with 50 cm to spare.
5. 3.12 m
6. 3 s, 52.0 m, 26.5 ms^{-1} at 49.1° to the horizontal.
7. 18.8 m, 21.7 m
8. 1.8 m, 1.2 s, 12.5 m; 10.4 ms^{-1} at 5.5° , 11.1 ms^{-1} at 21.1° downwards.
9. 24.3° , 65.7° ; 1.65 s, 3.65 s; 40 m
10. 32.0 ms^{-1} , 38.7°
11. 30 ms^{-1} , 4.24 s
12. 4.80° , 85.20° . The first is more likely.
13. 2.73 ms^{-1} . The locust must overcome air resistance.
14. 76.0°