Free Fall Solutions

1. vf2 = vo2 + 2ax; 11.52/19.6 = 6.7 m

ttot = 2 tup ; vf = vo + at; 11.5/9.8 = 1.17 s x 2 = 3.34 s

1. tup = ½ ttot = 1.5 s vf = vo+ at; vo = 9.8 )(1.5) = 14.7 m/s

vf2 = vo2 + 2ax; 14.72/19.6 = 11.0 m

1. x = ½ at2; x = ½ (9.8)(6.3)2 = 194 m; vf = vo + at; -9.8 )(6.3 s) = – 63.7 m/s
2. vf2 = vo2 + 2ax; vf = (2( – 9.8)(25) = -22.1 m/s. vf = vo + at; -22.1/- 9.8 = 2.26 s
3. x = ½ at2; (12/4.9)1/2 = 1.56 s; vf = vo+ at; – 9.8(1.56) = -15.3 m/s
4. vf2 = vo2 + 2ax; 73.52/19.6 = 275 m
5. UP: vf = vot; 0 = 20 – 9.8t; t = 2.04 s Max height; x = x0 + vot+ ½ at2;

7.5m + (20m/s)(2.04 s) – ½ 9.8)(2.04)2 = 27.9 m total

If caught, v = – 20 m/s

If missed: total height is 27.9, so t down is x = ½ at2;(27.9/4.9)1/2 = 2.40s

vf = vo+at; vf = (– 9.8)(2.40s) = -21.6 m/s