2-1. S = 60 mph
   1 mile = 5280 ft, 1h = 3600 sec.
   S = \frac{60 \times 5280}{3600} = 88\text{ ft/sec}

   They are equal

2-3. 65 mph = 29.06 m/sec
   Track length = 300 km
   Time allowed for qualifying
   \[ \Delta t = \frac{300}{0.029} = 1.03 \times 10^4 \text{ secs} \]
   Speed for 1st 150 km
   55 mph = 24.59 m/sec
   Time taken \[ \Delta t_1 = \frac{150}{0.025} = 6 \times 10^3 \text{ secs} \]
   Time available for second half
   \[ \Delta t - \Delta t_1 = (10.3 \times 10^3 - 6 \times 10^3) \text{ sec} \]
   = \[4.3 \times 10^3 \text{ sec} \]
   So speed required for 2nd half
   \[ S = \frac{150 \times 10^3}{4.3 \times 10^3} = 34.88 \text{ m/sec} \]
   = 78 mph

2-5. \[ r_1 = \sqrt{3^2 + 4^2} = 5 \text{ m} \]
    \[ r_2 = \sqrt{3^2 + 4^2} = 5 \text{ m} \]
    \[ r_3 = \sqrt{1 + 8 + 16} = 5 \text{ m} \]
    \[ r_4 = \sqrt{1 + 16 + 8} = 5 \text{ m} \]

2-7. Av. Speed = distance travelled
   time taken
   \[ = \frac{2\pi \times 100}{5 \times 60} = 2.1 \text{ m/sec} \]
   Av. Vel \( \langle v \rangle = \frac{\text{Displacement vector}}{\text{time elapsed}} \)
   = 0

2-9. \( v_{AB} \) positive
    \( v_{BC} = 0 \)
    \( v_{CD} \) negative
2-11. 55mph = 24.6 m/sec
Yes, you miss the deer.
Distance travelled in \( \frac{1}{3} \) sec = 8.2m

Distance travelled before stopping = \( \frac{0 - (24.6)^2}{-2 \times 2} \)
\[ = 151.3 \text{m} \]

Total distance = 159.5m

2-13. \( V^2 = V_i^2 + 2a(X - X_i) \)
\( V = 200 \text{mph} \Rightarrow \dot{x} = 89.5 \text{ m/sec} \)
\( V_i = 0 \)
\( (X - X_i) = 1100 \text{m} \)

So \( a = \frac{(89.5)^2}{2 \times 1100} = 3.6 \text{ m/s}^2 \)
\[ a = 3.6 \text{ m/s}^2 \dot{x} \]