

<p>F12-4 ↓</p> $v = (0.5t^3 - 8t) \text{ m/s}$ $A = \frac{dv}{dt}$ $\frac{dv}{dt} = 3(0.5)t^2 - 8 \text{ m/s}^2$ $= 1.5t^2 - 8$ $A = \frac{dv}{dt} \Big _{t=2} = 1.5(2)^2 - 8$ $= 6 - 8 = -2 \text{ m/s}^2$ <p>F12-3 ↓</p> $v = (4t - 3t^2) \text{ m/s}$ $s = \int v dt$ $s = \int (4t - 3t^2) dt$ $= 2t^2 - t^3$ <p>when <math>t = 4</math></p> $s = 2(4)^2 - (4)^3$ $= 32 - 64$ $s = -32 \text{ m}$ <p>F12-8 ↓</p> $v = (20 - 0.5s^2) \text{ m/s}$ $A = \frac{dv}{dt}$ $\frac{dv}{ds} = \frac{dv}{ds} \cdot \frac{ds}{dt}$ $\frac{dv}{ds} = -0.1s, \quad \frac{ds}{dt} = (20 - 0.5s^2)$ $A = (-0.1s)(20 - 0.5s^2)$	<p>when <math>s = 15</math></p> $A = (-0.1 \times 15)(20 - 0.5 \times (15)^2)$ $A = -13.125 \text{ m/s}^2$ <p>F12-7 ↓</p> $A = (4t^2 - 2) \text{ m/s}^2$ $v = \int A dt$ $= \int (4t^2 - 2) dt$ $= \frac{4t^3}{3} - 2t + C$ $s = \int v dt$ $= \int \left( \frac{4t^3}{3} - 2t + C \right) dt$ $= \frac{4t^4}{12} - \frac{2t^2}{2} + Ct$ $P = \frac{1}{3}t^4 - t^2 + Ct + K$ <p>when <math>t = 0, P = 2</math></p> $2 = \frac{1}{3}(0)^4 - (0)^2 + C(0) + K$ $K = -2$ <p>when <math>t = 2, P = 20, K = -2</math></p> $20 = \frac{1}{3}(2)^4 - 2^2 + C(2) - 2$ $20 = 0.7 + 2C$ $C = -9.65$ $P = \frac{1}{3}t^4 - t^2 - 9.7t - 2$ <p>when <math>t = 4</math></p> $P = \frac{1}{3}(4)^4 - 4^2 - (9.7 \times 4) - 2$ $P = 28.7 \text{ m}$
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