

Elementary Engineering Mathematics
Exercises #10 Answers

1. $W_{A \rightarrow B} \approx -286.6$ (in-lb)
2. $W_{A \rightarrow B} \approx -286.46$ (in-lb), so %error = -0.05%
3. a) $v(t) = 4t$ (m/s) for $0 \leq t \leq 5$
 $v(t) = 20$ (m/s) = constant for $5 \leq t \leq 10$
 $v(t) = 40 - 2t$ (m/s) for $10 \leq t \leq 20$
b) $s(t) = 2t^2$ (m) for $0 \leq t \leq 5$
 $s(t) = -50 + 20t$ (m) for $5 \leq t \leq 10$
 $s(t) = -150 + 40t - t^2$ (m) for $10 \leq t \leq 20$
c) total distance traveled is 250 (m)
4. a) $y(t)|_{t=3.5} \approx 65.3$ (ft)
b) total distance traveled is 109 (ft)
5. a) $v(t) = 20 - 9.81t$ (m/s)
b) $y(t) = 8 + 20t - 4.905t^2$ (m)
6. $M(x) = 375x - 50x^2$ (ft-lb) for $0 \leq x \leq 5$
 $M(x) = 1250 - 125x$ (ft-lb) for $5 \leq x \leq 10$
7. a) $v(t) = 4(1 - e^{-2t})$ (volts)
b) $p(t) = 8(e^{-2t} - e^{-4t})$ (watts)
c) $w(t) = 2 - 4e^{-2t} + 2e^{-4t}$ (joules)
As $t \rightarrow \infty$, $w \rightarrow 2$ (joules)
8. $i(t) = \frac{1}{3\pi}[1 - \cos(120\pi t)]$ (amps)