

Answers to Week 7

• Section 3.8

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 - $f'(x) = \sin(2x)$, $f''(x) = 2 \cos(2x)$
 - $y' = \frac{-2x}{(x^2 + 1)^2}$, $y'' = \frac{2(2x^2 - 1)}{(x^2 + 1)^3}$
- The graph through $(0, 1)$ is f , the graph through the origin is f' , and the graph through $(0, -2)$ is f'' .
- $2^{50}(-\cos(2x))$
- $f^{(n)}(x) = (-1)^n n! x^{-(n+1)}$

• Section 3.9

- $y - \sqrt{3} = \frac{2}{\sqrt{3}}(x - 2)$
- $y = \frac{1}{2}x - \frac{3}{2}$
- Horizontal: $(0, 1)$, Vertical: $(4, 5)$
- $y = \frac{1}{2}x + 4$, $y = -\frac{1}{2}x + 4$

• Section 3.10

- $12\pi \text{ m/s}^2$
- $\frac{5}{8} \text{ m/s}$
- $\frac{6}{41} \text{ rad/sec}$
- a) $-\frac{3}{2} \text{ ft/sec}$ b) $-\frac{9}{2} \text{ ft/sec}$
- $\frac{5}{48} \text{ m/min}$