

1. (b) all reals a
(c) $a \neq -1$
(d) $a \neq -1, 1$
(e) 2

2. (a) $1/2$
(b) $3/4$
(c) 1
(d) $-3/4$
(e) ∞

3. (a) 2 (show this by definition)
(b) $y = 2x - 1$
(c) $f(x) \approx 1 + 2(x - 1) = 2x - 1$
(d) 1.05

4.

$$(a) f''(x) = 6x - \frac{1}{2x^{3/2}} - \frac{6}{x^4}$$

$$(b) g''(\theta) = 4 \cos(\theta) - 2\theta \sin(\theta)$$

$$(c) h''(t) = \frac{1}{(t^2 + 1)^{3/2}}$$

5. $\left. \frac{dy}{dx} \right|_{(-2, -2)} = 3$

6. 50 mi/h