

AP CALCULUS PROBLEM SET #7 ANSWER KEY

MAX/MIN (CURVE ANALYSIS I)

1. a) $x = -2$

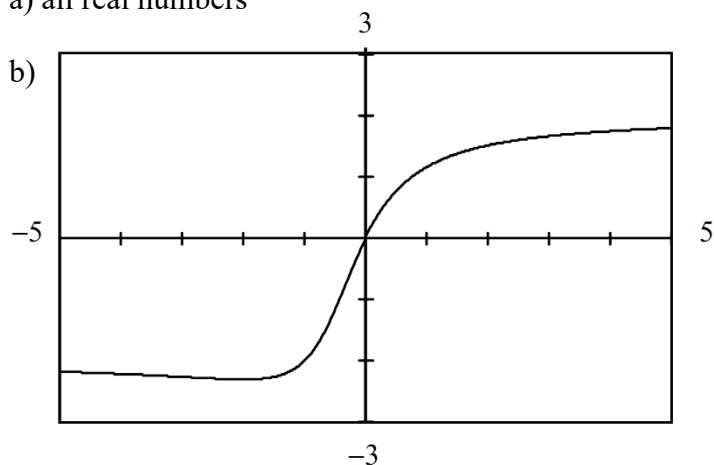
b) $f'(1) = 0$

c) $f'(-1) = \frac{4}{9}$

d) Range of f : $-1 < y \leq 1$

2. \$330

3. a) all real numbers



c) $y = -2, y = 2$

d) $\left[\frac{-4}{\sqrt{3}}, 2 \right)$

4. a) $x = -1$

b) $x = -5$

c) $f''(0) < 0$ on $(-7, -3), (2, 3), (3, 5)$

d) Abs. max at $x = 7$

5. a) $\left(\frac{1}{\sqrt{3}}, \frac{8}{3} \right)$

b) $\frac{dA}{dt} = 4 \text{ units}^2/\text{sec.}$

6. a) $x = 0, \frac{\pi}{2}, \pi$

b) $\frac{\pi}{6} < x < \frac{\pi}{2}, \frac{5\pi}{6} < x < \frac{3\pi}{2}$

c) abs min = $-\frac{1}{4}$, abs max = 2

7. a) $x \in R, x \neq 0$

b) even

c) relative max at $x = 1$

relative max at $x = -1$

d) range = $\left(-\infty, \ln \frac{1}{2} \right]$

8. a) $A(1) = \frac{49}{4}$ square units

b) $A(w)$ minimized at $w = \sqrt{2}$

9. a) $x^2 + 4y^2 = 7 + 3xy$

$$2x + 8y \frac{dy}{dx} = 3y + \frac{dy}{dx}(3x)$$

$$\frac{dy}{dx}(8y - 3x) = -2x + 3y$$

$$\frac{dy}{dx} = \frac{-2x + 3y}{8y - 3x} = \frac{3y - 2x}{8y - 3x}$$

b) Slope is 0 at $(3, 2)$

c) $\frac{d^2y}{dx^2}$ at $(3, 2) = -\frac{2}{7}$

$y' = 0$ and $y'' < 0$

local max @ $(3, 2)$