Name Answer Key Date _____

Ms. Schmidt Pre-Calculus

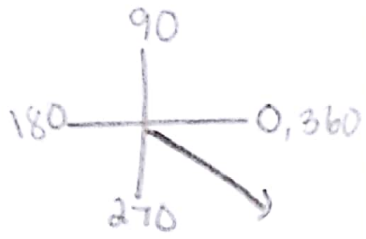
Final Review #1

1) $\theta = \frac{47\pi}{6} \cdot \frac{180}{\pi} =$

$\frac{47(180)}{6} = 1410°$

$1410 - 360 - 360 - 360 = 330°$

coterminal angle



IV

2) $\theta = \frac{26\pi}{4} \cdot \frac{180}{\pi}$

$\frac{26(180)}{4} = 1170$

$1170 - 360 - 360 - 360 = 90°$

coterminal angle

Quadrental angle

3) $\frac{1}{4} = 8^{8x+4}$

$(2^{-2}) = (2^3)^{8x+4}$

$-2 = 24x + 12$

$-12 \quad -12$

$\frac{-14}{24} = \frac{24x}{24}$

$\frac{-7}{12} = x$

4) $\frac{1}{125} = 25^{5x-5}$

$(5^{-3}) = (5^2)^{5x-5}$

$-3 = 10x - 10$

$+10 \quad +10$

$\frac{7}{10} = \frac{10x}{10}$

$\frac{7}{10} = x$

5) $f(x) = x^2 + x - 1 \quad (-8, 55)$

$$\lim_{h\to 0} \frac{[(x+h)^2 + (x+h) - 1] - [x^2 + x - 1]}{h}$$

$x^2 + 2xh + h^2 + x + h - x^2 - x + 1$

$$\lim_{h\to 0} \frac{2xh + h^2 + h}{h}$$

$$\lim_{h\to 0} 2x + h + 1 = 2x + 1 = f'(x)$$

$f'(-8) = 2(-8) + 1 = -16 + 1 = \boxed{-15}$

6) $f(x) = x^3 - 5x^2 \quad (-1, -6)$

$$\lim_{h\to 0} \frac{[(x+h)^3 - 5(x+h)^2] - [x^3 - 5x^2]}{h}$$

$$\frac{x^3 + 3x^2h + 3xh^2 + h^3 - 5x^2 - 10xh - 5h^2 + 5x^2 - x^3}{h}$$

$$\lim_{h\to 0} \frac{3x^2h + 3xh^2 + h^3 - 10xh - 5h^2}{h}$$

$$\lim_{h\to 0} 3x^2 + 3xh + h^2 - 10x - 5h$$

$f'(x) = 3x^2 - 10x$

$f'(-1) = 3(-1)^2 - 10(-1) = 3 + 10 = \boxed{13}$

7) hyperbola

Center $(-3, 2)$

Focus $(-32, 2)$

Vertex $(17, 2)$

horizontal (a^2 must be over x and x is positive)

c) $$\frac{(x+3)^2}{400} - \frac{(y-2)^2}{441} = 1$$

8) hyperbola

Center $(-2, -4)$

focus $(-2, 22)$

vertex $(-2, 20)$

(a is over y and y is positive)

d) $$\frac{(y+4)^2}{576} - \frac{(x+2)^2}{100} = 1$$

9)

$f(x) = x^5 + 5x^4 - 7x^3 + 4x^2 + 3x + 1$

Zeros $\rightarrow$ 5 zeros (n)

Extrema $\rightarrow$ 4 extrema ($n-1$)

10)

$f(x) = x^3 + 2x^2 - 4x - 5$

Zeros $\rightarrow$ 3

extrema $\rightarrow$ 2

11)

$f(x) = 9|x+7|$

Domain: $(-\infty, \infty)$

Range: $[0, \infty)$

12)

$f(x) = 3|x+3|$

Domain: $(-\infty, \infty)$

Range: $[0, \infty)$

13)

Increasing

$(-\infty, -1)$

Decreasing $(1, \infty)$

constant $(-1, 1)$

14)

Increasing

$(-\infty, 2)$

Decreasing

$(2, \infty)$

Constant X

15)

$f(x) = |5x|$ $g(x) = 2x$

$(g \circ f)(x) = 2(|5x|)$

$= 2|5x|$

16)

$f(x) = 4\sqrt{x}$ $g(x) = x - 6$

$f(g(x)) = 4\sqrt{x-6}$

17)

$f(x) = 4x - 4$

$x = 4y - 4$

$+4 \quad +4$

$\frac{x+4}{4} = \frac{4y}{4}$

$\frac{x+4}{4} = y = f^{-1}(x)$

18)

$f(x) = 3x + 4$

$x = 3y + 4$

$-4 \quad -4$

$\frac{x-4}{3} = \frac{3y}{3}$

$\frac{x-4}{3} = y = f^{-1}(x)$

19)

$\log_b \sqrt{\frac{49}{69}}$

$\log_b \left(\frac{49}{69}\right)^{1/2}$

$\frac{1}{2} \log_b \left(\frac{49}{69}\right)$

$\frac{1}{2}(\log_b 49 - \log_b 69)$

20)

$\log_b \sqrt{xy}$

$\log_b (xy)^{1/2}$

$\frac{1}{2} \log_b xy$

$\frac{1}{2}(\log_b x + \log_b y)$