

Name Answer Key

Date _____

Ms. Schmidt

Pre-Calculus

Test 8 Review Answer Sheet

1a)

$$\log \frac{(ab)^2}{c}$$

$$\log (ab)^2 - \log c$$

$$2(\log a + \log b) - \log c$$

1b)

$$\log \frac{c^3 \sqrt{a}}{\sqrt{b}} \rightarrow \frac{ca^{1/3}}{b^{1/2}}$$

$$\log c^3 \sqrt{a} - \frac{1}{2} \log b$$

$$\log c + \frac{1}{3} \log a - \frac{1}{2} \log b$$

1c)

$$\log \sqrt[4]{\frac{ab}{c}} \rightarrow \left(\frac{ab}{c}\right)^{1/4}$$

$$\frac{1}{4} \log \frac{ab}{\log c}$$

$$\frac{1}{4} (\log a + \log b - \log c)$$

2a)

$$\frac{1}{2} \log x - 2 \log y$$

$$\log \sqrt{x} - \log y^2$$

$$\log \frac{\sqrt{x}}{y^2}$$

2b)

$$2(\log x + \log y) - \frac{1}{2} \log c$$

$$2(\log xy) - \log \sqrt{c}$$

$$\log \frac{(xy)^2}{\sqrt{c}}$$

3a)

$$8^{3x+1} = 32^{x+5}$$

$$(2^3)^{3x+1} = (2^5)^{x+5}$$

$$9x+3 = 5x+25$$

$$4x+3 = 25$$

$$4x = 22$$

$$x = \frac{11}{2}$$

3b)

$$343^{x-2} = \left(\frac{1}{49}\right)^{x-12}$$

$$(7^3)^{x-2} = (7^{-2})^{x-12}$$

$$3x-6 = -2x+24$$

$$5x-6 = 24$$

$$5x = 30$$

$$x = 6$$

3c)

$$\log_4 x = 3$$

$$4^3 = x$$

$$64 = x$$

3d)

$$\log_x 625 = 4$$

$$\sqrt[4]{x^4} = \sqrt[4]{625}$$

$$x = \pm 5$$

4a)

$$f(g(x))$$

$$f(x) = x+2 \quad g(x) = x^2 - x + 4$$

$$(x^2 - x + 4) + 2$$

$$f(g(x)) = x^2 - x + 6$$

4b)

$$(g \circ f)(x)$$

$$f(x) = 2x+5$$

$$g(x) = 2x^2 - 3x - 1$$

$$2(2x+5)^2 - 3(2x+5) - 1$$

$$2(4x^2 + 20x + 25) - 6x - 15 - 1$$

$$8x^2 + 40x + 50 - 6x - 16$$

$$8x^2 + 34x + 34$$

5a)

$$\log_5(x+3) - \log_5 3 = \log_5 x$$

$$\log_5 \frac{x+3}{3} = \log_5 x$$

$$\frac{x+3}{3} = \frac{x}{1}$$

$$3x = x+3$$

$$2x = 3$$

$$x = 3/2$$

5b)

$$\log_2(x-6) + \log_2 x = \log_2(x+8)$$

$$\log_2 x(x-6) = \log_2(x+8)$$

$$x(x-6) = x+8$$

$$x^2 - 6x = x+8$$

$$-x-8 \quad -x-8$$

$$x^2 - 7x - 8 = 0$$

$$(x-8)(x+1) = 0$$

$$x=8 \quad x=-1$$

5c)

$$\log_4 x + \log_4(x+6) = 2$$

$$\log_4 x(x+6) = 2$$

$$4^2 = x(x+6)$$

$$16 = x^2 + 6x$$

$$0 = x^2 + 6x - 16$$

$$0 = (x+8)(x-2)$$

$$x=-8 \quad x=2$$

5d)

$$\log_5(x^2+9) - \log_5 2 = 1$$

$$\log_5 \frac{x^2+9}{2} = 1$$

$$5^1 = \frac{x^2+9}{2}$$

$$x^2+9 = 10$$

$$x^2 - 1 = 0$$

$$(x-1)(x+1) = 0$$

$$x=1 \quad x=-1$$

6a)

$$f(x) = \frac{1}{4}x + 6$$

$$y = \frac{1}{4}x + 6$$

$$x = \frac{1}{4}y + 6$$

$$4(x-6) = (\frac{1}{4}y)4$$

$$4x - 24 = f^{-1}(x)$$

6b)

$$f(x) = \sqrt{x-3}$$

$$y = \sqrt{x-3}$$

$$x^2 = (\sqrt{y-3})^2$$

$$x^2 = y-3$$

$$+3 \quad y+3$$

$$x^2 + 3 = f^{-1}(x)$$

6c)

$$f(x) = x^3 + 5$$

$$y = x^3 + 5$$

$$x = y^3 + 5$$

$$(x-5)^{\frac{1}{3}} = y^{\frac{1}{3}}$$

$$\sqrt[3]{x-5} = f^{-1}(x)$$

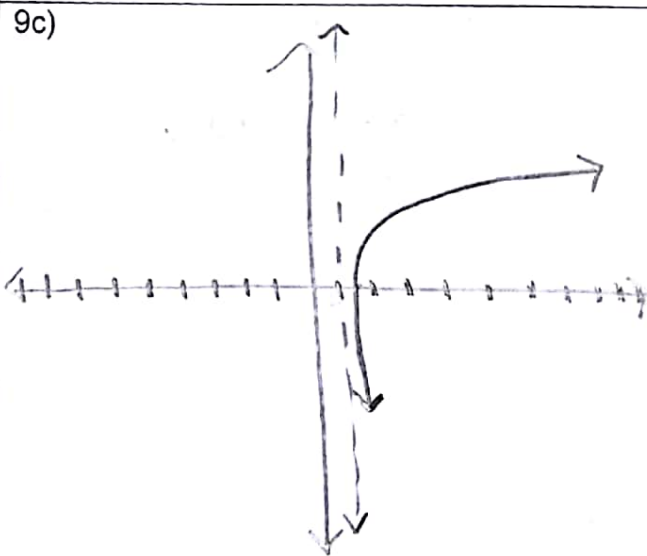
7) $A = P(1 + \frac{r}{n})^{nt}$
 $A = 4200(1 + \frac{0.025}{4})^{4t}$

$t=5$ $A = 4200(1.00625)^{4(5)}$
 $A = 4757.37$

$A = 8400$
 $8400 = 4200(1.00625)^{4t}$
 $2 = (1.00625)^{4t}$
 $\frac{\log 2}{4 \log 1.00625} = \frac{4t \log 1.00625}{4 \log 1.00625}$
 $28 \text{ years} \approx 27.8 = t$

9a) $g(x) = \log_3(x-1) + 2$
 Right 1, up 2

9b) $D (1, \infty)$
 VA $x=1$
 x-int $(1.11, 0)$ in calc!
 y-int DNE



8) $f(t) = 5(\frac{1}{2})^{\frac{t}{n}}$
 $f(t) = 8(\frac{1}{2})^{\frac{t}{238}}$

$t=100$ $f(t) = 8(\frac{1}{2})^{\frac{100}{238}}$
 $f(100) = 5.979 \text{ kg}$

$f(t) = 1.5 \text{ kg}$ (238) 2.415037... = \frac{t}{238} (238)
 $\frac{1.5}{8} = \frac{8(\frac{1}{2})^{\frac{t}{238}}}{8}$
 $\frac{3}{16} = \frac{1}{2}^{\frac{t}{238}}$ $574.78 = t$
 $\frac{\log 3/16}{\log 1/2} = \frac{t}{238} \frac{\log 1/2}{\log 1/2}$ 575 years

10a) $g(x) = \log_2(x+5) - 3$
 left 5, down 3

10b) $D (-5, \infty)$ $y = \log_2(x+5) - 3$
 VA $x=-5$ $y = \log_2(5) - 3$
 x-int $(3, 0)$ $y = -0.678$
 y-int $(0, -0.678)$

