

Unit Review 2

Thursday, April 25, 2019 12:01 PM



Unit Review 2

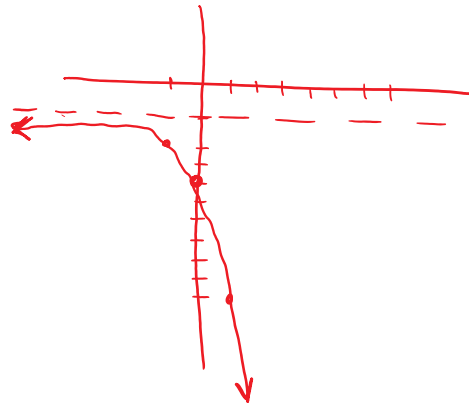
Unit 7 Review

Graphing

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

List the...

- Parent Graph $y = 3^x$
- Transformations *reflect x-axis, down 1, left 1*
- Horizontal Asymptote $y = -1$
- Y-Intercept $(0, -4)$
- 2 points $(-1, -2)$ $(1, -10)$
- Graph



Solve the Equation

$$\bullet 8^{2x} = 4^{x-6}$$

$$(2^3)^{2x} = (2^2)^{x-6}$$

$$2^{6x} = 2^{2x-12}$$

$$6x = 2x - 12$$

$$4x = -12$$

$$x = -3$$

$$\bullet \left(\frac{1}{2}\right)^{x-1} = 32^{2x}$$

$$(2^{-1})^{x-1} = (2^5)^{2x}$$

$$2^{-x+1} = 2^{10x}$$

$$-x+1 = 10x$$

$$1 = 11x$$

$$x = \frac{1}{11}$$

Solve the Equation

$$\log(7^{x+3}) = \log(13^{x-8})$$

$$(x+3)\log 7 = (x-8)\log 13$$

$$(x+3)0.845 = (x-8)1.114$$

$$\begin{array}{r} 0.845x + 2.535 = 1.114x - 8.912 \\ -1.114x \quad -2.535 \quad -1.114x \quad -2.535 \end{array}$$

$$-0.269x = -11.447$$

$$x = 42.554$$

Expand the Logarithms

• $\log_3 2x\sqrt{3y}$

$$\log_3 2x + \log_3 \sqrt{3y}$$

$$\log_3 2 + \log_3 x + \log_3 (3y)^{1/2}$$

$$\log_3 2 + \log_3 x + \frac{1}{2}(\log_3 3 + \log_3 y)$$

$$\log_3 2 + \log_3 x + \frac{1}{2} + \frac{1}{2}\log_3 y$$

• $\ln \frac{3a^2b}{c^3}$

$$\ln 3a^2b - \ln c^3$$

$$\ln 3 + 2\ln a + \ln b - 3\ln c$$

Condense the Logarithms

$$\bullet \log_4 x + 2 \log_4 y - \frac{1}{3} \log_4 z$$

$$\log_4 \frac{x(y^2)}{z^{1/3}}$$

$$\log_4 \frac{xy^2}{\sqrt[3]{z}}$$

$$\bullet \ln(4x^2 - 9) - \ln(6x - 9)$$

$$\ln \frac{4x^2 - 9}{6x - 9}$$

$$\ln \frac{(2x-3)(2x+3)}{3(2x-3)}$$

$$\ln \frac{2x+3}{3}$$

Solve the Equations

• $\log_{1/3} x = -4$

$$\left(\frac{1}{3}\right)^{-4} = x$$

$$x = 81$$

• $\log 16 - \log 2x = 4$

$$\log \frac{16}{2x} = 4$$

$$10^4 = \frac{16}{2x}$$

$$10000 = \frac{16}{2x}$$

$$20000x = 16$$

$$x = \frac{16}{20000}$$

Solve the Equations

• $2(3^{2x-5}) - 4 = 11$

$$2(3^{2x-5}) = 15$$

$$3^{2x-5} = 7.5$$

$$\log_3 7.5 = 2x - 5$$

$$6.834 = 2x$$

$$x = 3.417$$

• $2 \ln x = 12$

$$\ln x = 6$$

$$e^6 = x$$

$$x = 403.429$$

Apps

- Jamie invested \$1200 in a savings account at the bank. The account now has \$2000 in it. The rate that the bank offered was 0.35%. How long ago did Jamie open the savings account if the interest is compounded

- Monthly? $2000 = 1200 \left(1 + \frac{0.0035}{12}\right)^{12t}$
 $1.667 = (1.00029)^{12t}$

$$\log_{1.00029} 1.667 = 12t$$

$$t = 146.8 \text{ years ago}$$

- Continuously?

$$A = Pe^{rt}$$

$$2000 = 1200 e^{0.0035t}$$

$$1.667 = e^{0.0035t}$$

$$\ln 1.667 = 0.0035t$$

$$t = 145.96 \text{ years}$$

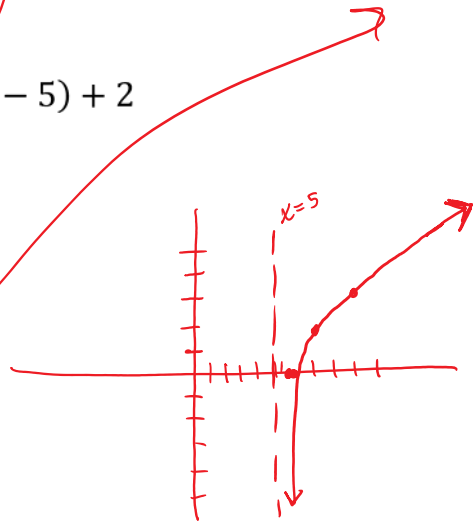
Graphing

$$\log_4 4 = 1$$
$$\log_4 1 = 0$$

$$g(x) = \log_4(x - 5) + 2$$

List the...

- Parent Graph $\log_4 x$
- Transformations up 2, right 5
- ~~Horizontal~~ ^{vertical} Asymptote $x = 5$
- X-Intercept $0 = \log_4(x - 5) + 2$
 $(5.06, 0)$
- 2 points $(9, 3)$ $(6, 2)$
- Graph



$$0 = \log_4(x - 5) + 2$$
$$-\log_4(x - 5) = -2$$
$$4^{-2} = x - 5$$
$$\frac{1}{16} = x - 5$$
$$5 + \frac{1}{16} = x$$
$$\frac{81}{16} = x$$
$$5.06$$