

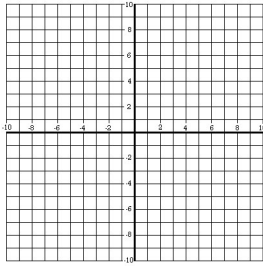
Pre-Calculus Review Quiz #14

Chapter: 11-4 to 11-6

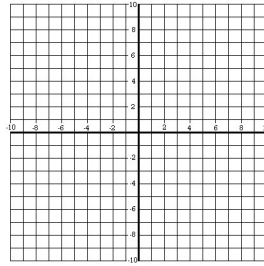
Name _____ Pd _____

Topic 1: graphing – graph the following

1. $y = \log_2 x$



2. $y = \log_{15} x$



Topic 2: solving for x

3. $\log_4 5 + \log_4 x = \log_4 30$

4. $\log_8 20 - \log_8 5x = \log_8 2$

5. $\log_4(x^2 + 2) + \log_4 4 = \log_4 -8$

6. $\log_6 11x - \log_6(x^2 - 3) = \log_6 2$

7. $8 \cdot 2^{n-3} = 42.5$

8. $5^{5x-2} = 2^{2x+1}$

9. $4^x = \sqrt{5^{x+2}}$

10. $\ln e^x = 4$

11. $5e^{-x} - 7 = 2$

12. $\ln 5x = 2$

Topic 3: Extensions and Applications

13. Which of the following is not equivalent to $(\log a - \log b)^x = \log(cd)$

A. $(\log \frac{a}{b})^x = \log(cd)$

B. $(\log \frac{a}{b}) = x \log(cd)$

C. $(\log a - \log b)^x = \log c + \log d$

D. $x \log \frac{a}{b} = \log(cd)$

14. Tom is investing \$400 in an account that earns an APR of 7% interest continuously.

- a. How much will the account be worth in 10 years?
- b. How long until the account is worth a million dollars?

15. The Loudness, L in decibels is given by $L = 10 \log R$ where R is the relative intensity of the sound.

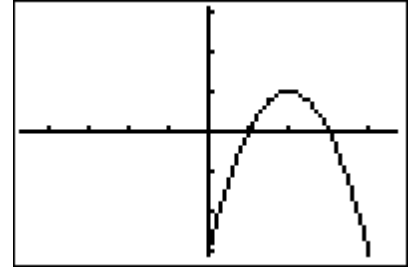
- a. A stadium crowd produces a loudness of 90 decibels. What is the relative intensity of each person if there are 15,000 people in the crowd?
- b. How many decibels does the sound increase when the relative intensity is doubled?

Topic 4: Review Materials

16. State the equation of the line that passes through $(2, 4)$ and is parallel to $y - 2 = \frac{1}{2}(x + 2)$ in point-slope form $y - y_1 = m(x - x_1)$

17. Use the graph to answer the following questions:

- State the Max or Min
- Is the function represent an even or odd degree function?
- State the zeros
- State the y-intercept
- State the end behavior



18. Factor completely and state all roots $y = 2x^3 + 3x^2 - 9x$

19. Use the quadratic formula to find the imaginary roots of $y = 2x^2 + 5$

20. Rationalize the denominator in the following:

$$\frac{2}{\sqrt{3}}$$

$$\frac{\sqrt{x}}{\sqrt{x-3}}$$

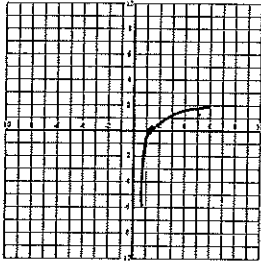
$$\frac{x}{\sqrt{x-3}}$$

21. Divide: $x - 4 \overline{) 2x^2 - x - 28}$

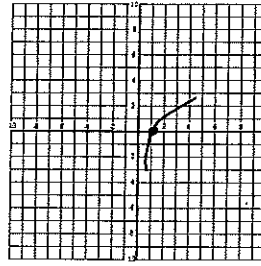
22. Solve for x $\frac{2}{x} + \frac{x^2}{x+1} = x$

Topic 1: graphing – graph the following

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6. $\log_6 11x - \log_6 (x^2 - 3) = \log_6 2$

7. $8 \cdot 2^{n-3} = 42.5$

8. $5^{5x-2} = 2^{2x+1}$

9. $4^x = \sqrt{5^{x+2}}$

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B. $(\log \frac{a}{b}) = x \log(cd)$

C. $(\log a - \log b)^x = \log c + \log d$

D. $x \log \frac{a}{b} = \log(cd)$

14. Tom is investing \$400 in an account that earns an APR of 7% interest continuously.

a. How much will the account be worth in 10 years?

b. How long until the account is worth a million dollars?

$$1000000 = 400e^{.07x}$$

$$2500 = e^{.07x}$$

$$\ln 2500 = .07x$$

$$x = 111 \text{ years}$$

$$A = Pe^{rt}$$

$$A = 400e^{.07(10)} = 805$$

15. The Loudness, L in decibels is given by $L = 10 \log R$ where R is the relative intensity of the sound.

a. A stadium crowd produces a loudness of 90 decibels. What is the relative intensity of each person if there are 15,000 people in the crowd?

$$90 = 10 \log R \quad 9 = \log R \quad R = 10^9$$

b. How many decibels does the sound increase when the relative intensity is doubled?

$$L = 10 \log 2$$

$$L = 3.01$$

$$L = 10 \log 2^2$$

$$L = 6.02$$

per person

$$\frac{10^9}{15000} =$$

$$66,667$$

Notebook/Homework Check:

$$L = 10 \log 10 \quad L = 10 \log 20$$

$$L = 10 \quad L = 13.01$$

3 more

proof on back of

$$\textcircled{3} \log_4(5x) = \log_4 30$$

$$5x = 30$$

$$x = 6$$

$$\textcircled{5} \log_4 [4(x^2+2)] = \log_4 (-8)$$

$$4x^2 + 8 = -8$$

$$4x^2 = -16$$

$$x^2 = -4$$

$$x = \pm 2i$$

$$\textcircled{7} (n-3) \ln 8.2 = \ln 42.5$$

$$n = \frac{\ln 42.5}{\ln 8.2} + 3 = 4.8$$

$$4^{2x} = 5^{x+2}$$

$$\textcircled{9} 2x \ln 4 = (x+2) \ln 5$$

$$2.8x = 1.6x + 3.2$$

$$1.2x = 3.2$$

$$x = 2.7$$

$$\textcircled{11} 5e^{-x} = 9$$

$$e^{-x} = \frac{9}{5}$$

$$\ln e^{-x} = \ln\left(\frac{9}{5}\right)$$

$$-x = \ln\left(\frac{9}{5}\right)$$

$$x = -.6$$

$$\textcircled{14} \log_8 \frac{20}{5x} = \log_8 2$$

$$\frac{20}{5x} = 2$$

$$20 = 10x$$

$$2 = x$$

$$\textcircled{6} \log_6 \left[\frac{11x}{x^2-3} \right] = \log_6(2)$$

$$11x = 2(x^2-3)$$

$$0 = 2x^2 - 11x - 6$$

$$x = \frac{11 \pm \sqrt{121 - 4(2)(-6)}}{2(2)} = \frac{11 \pm 13}{4}$$

$$\textcircled{8} = 64^{-\frac{1}{2}}$$

$$(5x-2) \ln 5 = (2x+1) \ln 2$$

$$5x \ln 5 - 2 \ln 5 = 2x \ln 2 + \ln 2$$

$$8x - 3.2 = 1.4x + .7$$

$$6.6x = 3.9$$

$$x = .6$$

$$\textcircled{10} x = 4$$

$$\textcircled{12}$$

$$5x = e^2$$

$$x = \frac{e^2}{5} = 1.48$$

Topic 4: Review Materials

16. State the equation of the line that passes through (2, 4) and is parallel to $y - 2 = \frac{1}{2}(x + 2)$ in point-slope form $y - y_1 = m(x - x_1)$

$$y - 4 = \frac{1}{2}(x - 2)$$

17. Use the graph to answer the following questions:

a. State the Max or Min

(2, 1)

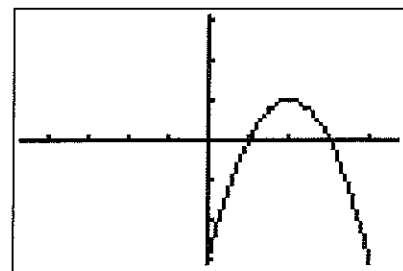
b. Is the function represent an even or odd degree function?

c. State the zeros 1, 3

d. State the y-intercept -3

e. State the end behavior

$$\begin{aligned} x \rightarrow \infty & \quad y \rightarrow -\infty \\ x \rightarrow -\infty & \quad y \rightarrow -\infty \end{aligned}$$



18. Factor completely and state all roots $y = 2x^3 + 3x^2 - 9x$

$$y = x(x+3)(2x-3)$$

roots: 0, -3, 1.5

19. Use the quadratic formula to find the imaginary roots of $y = 2x^2 + 5$

$$x = \frac{0 \pm \sqrt{0 - 4(2)(5)}}{2(2)} = \frac{\pm \sqrt{-40}}{4} = \frac{\pm i\sqrt{40}}{4} = \frac{\pm 2i\sqrt{10}}{4}$$

20. Rationalize the denominator in the following:

$$= \frac{\pm i\sqrt{10}}{2}$$

$$\frac{2\sqrt{3}}{\sqrt{3}\sqrt{3}} = \frac{2\sqrt{3}}{3}$$

$$\frac{\sqrt{x}}{\sqrt{x-3}} \cdot \frac{\sqrt{x-3}}{\sqrt{x-3}} = \frac{\sqrt{x}\sqrt{x-3}}{x-3}$$

$$\frac{x}{(\sqrt{x-3})(\sqrt{x+3})} = \frac{x\sqrt{x+3}}{x-9}$$

21. Divide:

$$\begin{array}{r} 2x+7 \\ x-4 \overline{) 2x^2 - x - 28} \\ \underline{-2x^2 + 8x} \\ 7x - 28 \\ \underline{-7x + 28} \\ 0 \end{array}$$

22. Solve for x

$$\left[\frac{2}{x} + \frac{x^2}{x+1} = x \right] \cdot x(x+1)$$

$$2(x+1) + x^2 \cdot x = x \cdot x(x+1)$$

$$2x+2 + x^3 = x^3 + x^2$$

$$2x+2 = x^2$$

$$0 = x^2 - 2x - 2$$

or

$$x = \frac{2 \pm \sqrt{4 - 4(1)(-2)}}{2(1)}$$

$$= \frac{2 \pm \sqrt{12}}{2} = \frac{2 \pm \sqrt{4}\sqrt{3}}{2} = \frac{2 \pm 2\sqrt{3}}{2}$$

$$= 1 \pm \sqrt{3}$$