Math 2
Name: __Key__

Unit 3 Test Review
Date:_____

Rewrite the following using radical notation and simplify if possible:

1) $y^{\frac{5}{9}}$

$\sqrt[9]{y^5}$

2) $(-8)^{\frac{4}{3}}$

16

3) $45^{\frac{1}{2}}$

$\sqrt{45}$

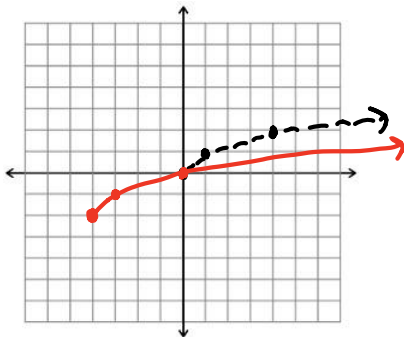Rewrite the following using rational exponent notation:

4) $\sqrt{22}$

$22^{1/2}$

5) $(\sqrt[7]{22})^3$

$22^{3/7}$

6) $(\sqrt[5]{-36})^7$

$(-36)^{7/5}$

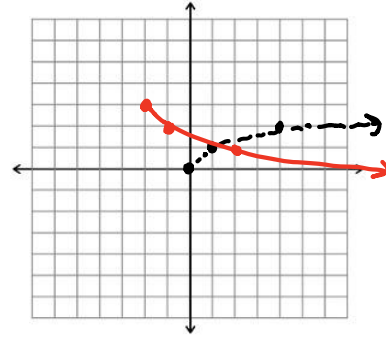Graph the following square root functions and then state the domain and range of each:

7) $y = \sqrt{x+4} - 2$

Domain: ___$x \geq -4$___

Range: ___$y \geq -2$___

8) $y = -\sqrt{x+2} + 3$

Domain: ___$x \geq -2$___

Range: ___$y \leq 3$___

Solve the following radical / rational exponent equations and check for extraneous solutions:

9) $\sqrt[3]{2x-4} = -2$

$x = -2$

10) $\sqrt{x+1} - 2 = 7$

$x = 80$

11) $\sqrt{3x+28} = x$

$x = 7$ ✓ $x = -4$ ✗

12) $\sqrt{5x+11} = \sqrt{7x+1}$

$x = 5$

13) $(x-5)^{\frac{3}{2}} + 2 = 10$

$x = 9$

14) $(x+3)^{\frac{4}{3}} - 25 = 56$

$x = 24$

Solve the following applications:

15) The function $d = \sqrt{2h}$ can be used to estimate the distance (in miles) to the horizon d from a given height (in feet) h. How far is the horizon (to two decimal places) if you are at a height of 1200 feet?

$d = 49$ mi

16) The function $d = \sqrt{2h}$ can be used to estimate the distance (in miles) to the horizon d from a given height (in feet) h. At what height would you be if you spotted a boat and the horizon that was 8 miles away?

$h = 32$ ft.

Solve the following direct, inverse, and joint variation problems:

17) Suppose y varies directly with x. When $x = 5$, $y = 20$, find y when $x = 10$.

$$y = 40$$

18) Suppose y varies inversely with the square of x, and $y = 50$ when $x = 4$. Find y when $x = 5$.

$$y = 32$$

19) Suppose that y varies directly with x and inversely with the square of z. If $x = 48$ when $y = 8$ and $z = 3$. Find the constant of variation(k) and x when $y = 12$ and $z = 2$.

$$x = 32$$

20) When a person swims underwater, the pressure in his or her ears varies directly with the depth at which he or she is swimming. At 10 feet, the pressure is about 4.3 pounds per square inch. Find the pressure if the depth is 60 feet.

$$28.5 \text{ lbs/in}^2$$

21) When air is pumped into a tire, the pressure required varies inversely as the volume of the air. If the pressure is 30 lb/in² when the volume is 140 in³, find the pressure when the volume is 100 in³.

$$42 \text{ lb/in}^2$$

22) The time required to complete a job varies inversely as the number of people working. It took 4 hours for 7 electricians to wire a building. How long would it have taken 3 electricians to have done the job?

$$9.\overline{3} \text{ hrs}$$

Graph the following inverse variation functions. Identify the horizontal and vertical asymptotes. Use a to determine the guide points and which quadrants you would find your branches.
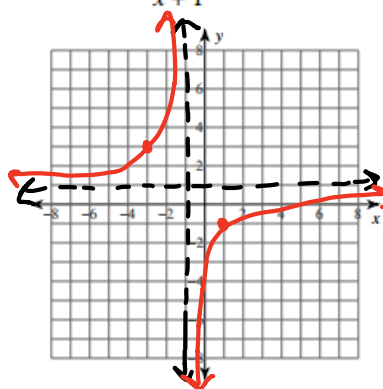
23) $f(x) = \dfrac{3}{x+1} - 2$
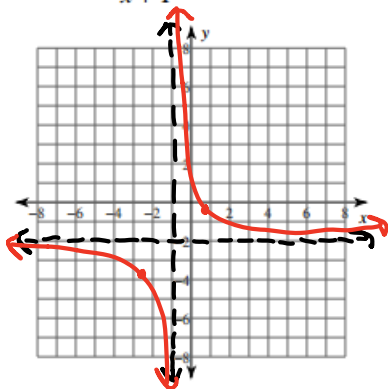
H.A. $y = -2$
V.A. $x = -1$

Guide Pts

24) $f(x) = -\dfrac{4}{x+1} + 1$

H.A. $y = 1$
V.A. $x = -1$

Guide Pts