

**Key**

## Unit 1 Test Review

Date \_\_\_\_\_

Solve each equation. Remember to check for extraneous solutions.

$$1) 6 = \sqrt{2n+48}$$

$$(6)^2 = (\sqrt{2n+48})^2$$

$$36 = 2n + 48$$

$$-12 = 2n$$

$$\boxed{-6 = n}$$

Simplify.

$$3) \sqrt{20} = \sqrt{4 \cdot 5}$$

$$= 2\sqrt{5}$$

$$5) \sqrt{16b^2} = \boxed{4b}$$

$$7) \sqrt{12} \cdot \sqrt{15}$$

$$\sqrt{4 \cdot 3} \cdot \sqrt{15}$$

$$2\sqrt{3} \cdot \sqrt{15}$$

$$2\sqrt{45}$$

$$2\sqrt{9 \cdot 5} = \boxed{6\sqrt{5}}$$

Simplify. Your answer should contain only positive exponents.

$$9) (2x)^0 \cdot 3x^2$$

$$1 \cdot 3x^2$$

$$\boxed{3x^2}$$

$$2) \sqrt{3x+7} = x-1$$

$$3x+7 = (x-1)(x-1)$$

$$3x+7 = x^2 - x - x + 1$$

$$3x+7 = x^2 - 2x + 1$$

$$0 = x^2 - 5x - 6$$

$$0 = (x-6)(x+1)$$

$$\boxed{x=6} \quad \boxed{x=-1}$$

$$4) \sqrt{80}$$

$$= \sqrt{16 \cdot 5} = \boxed{4\sqrt{5}}$$

$$6) \sqrt{50v^4} = \sqrt{25 \cdot 2v^4}$$

$$\boxed{5v^2\sqrt{2}}$$

$$8) \sqrt{3} \cdot \sqrt{3} = \sqrt{9} = \boxed{3}$$

$$10) (3x^0)^2 \cdot 2x \cdot 3x$$

$$9x^0 \cdot 2x \cdot 3x$$

$$\boxed{54x^2}$$

Simplify.

11)  $3n^3 \cdot 3n^3$

$$\boxed{9n^6}$$

12)  $2a^0 \cdot a^3$

$$\boxed{2a^3}$$

13) Simplify:  $(ab - 3)^0$

$$\boxed{1}$$

Write each expression in exponential form.

14)  $(\sqrt[6]{10p})^5 = \boxed{(10p)^{\frac{5}{6}}}$

Write each expression in radical form.

15)  $(2n)^{\frac{1}{2}} = \boxed{\sqrt{2n}}$

- 17) If  $x$  and  $y$  vary inversely, what happens to the value of  $x$  as  $y$  increases?

$\boxed{\text{decrease}}$

- 16) The time  $t$  it takes Adam to drive to Disney World varies inversely with his speed. If it takes Adam 10.8 hours at an average speed of 50 miles per hour, how long would it take him to get there at an average speed of 60 miles per hour?

$$t = \frac{k}{s}$$

$$10.8 = \frac{k}{50}$$

$$540 = k$$

$$t = \frac{540}{s}$$

$$t = \frac{540}{60}$$

$$\boxed{t = 9 \text{ hours}}$$

- 18) Given the following equation that represents a direct variation, identify the constant of variation ( $k$ ).

$$5y = x$$

$$y = \frac{x}{5}$$

direct variation

$$k = \frac{1}{5}$$

Simplify.

19)  $\sqrt{80}$

$$\sqrt{16 \cdot 5}$$

$$\boxed{4\sqrt{5}}$$

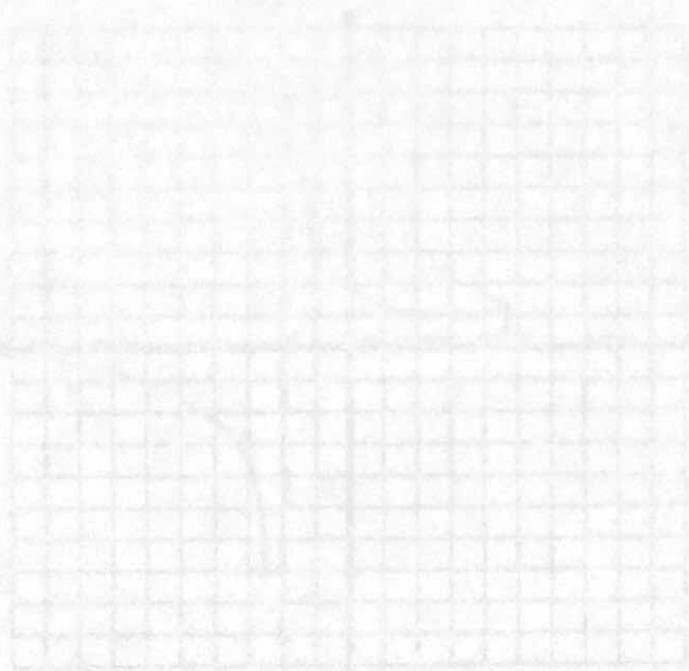
20)  $\sqrt{512}$

$$\sqrt{256 \cdot 2}$$

$$\boxed{16\sqrt{2}}$$

21) Graph the following function and label the vertical asymptote.

$$y = \frac{3}{x+2}$$



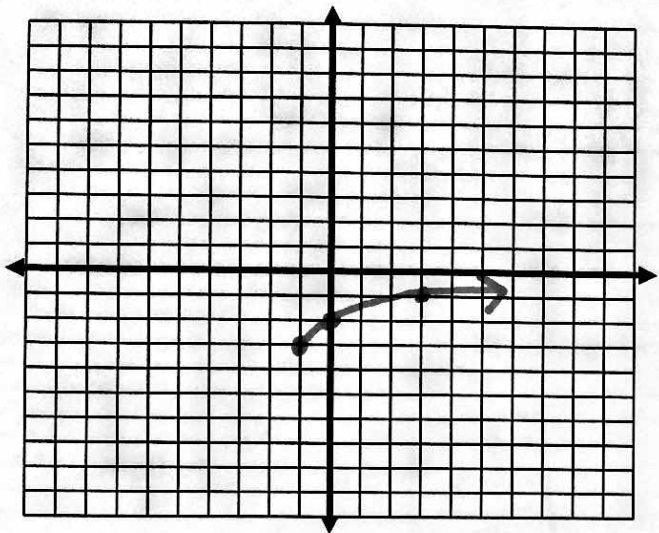
$$\begin{array}{r|l} x & y \\ -1 & 3 \\ -2 & 1.5 \end{array}$$

22) Solve the following rational function. Be sure to check for extraneous solutions.

Work must be shown.

$$\frac{3}{x+2} = \frac{1}{x-1}$$

21) Graph the function of  $y = \sqrt{x+1} - 3$  on the graph below. Then state the transformations from the parent function, domain, and range.



Transformations:

left 1, down 3

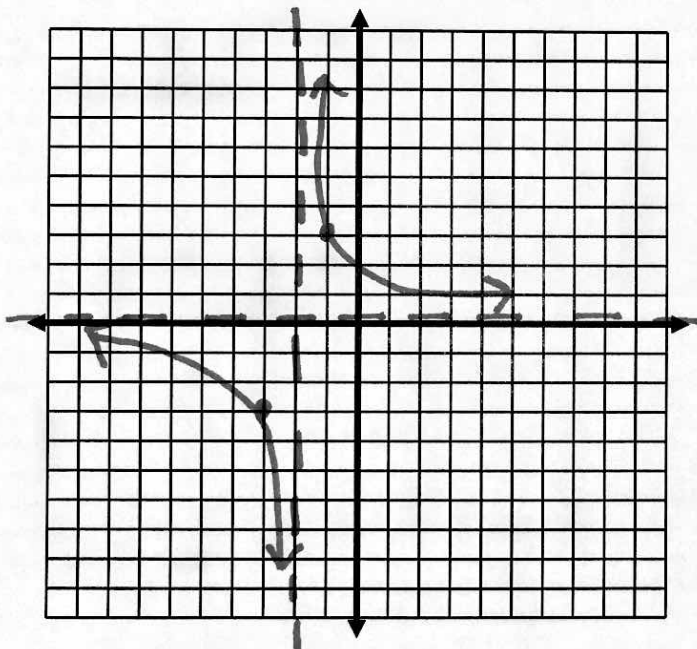
Domain:  $x \geq -1$

Range:  $y \geq -3$

x	y
-1	-3
0	-2
3	-1

22) Graph the following function and state the vertical asymptote.

$$y = \frac{3}{x+2}$$



x	y
-1	3
-3	-3

Vertical Asymptote:  $x = -2$

Horizontal Asymptote:  $y = 0$

23) Solve the following rational function. Be sure to check for extraneous solutions.

All work must be shown.

$$\frac{3}{x+2} = \frac{9}{x-1}$$

$$3(x-1) = 9(x+2)$$

$$3x-3 = 9x+18$$

$$-21 = 6x$$

$$\boxed{-\frac{21}{6} = x}$$

24) Solve the following equation. All work must be shown.

$$\begin{aligned}\sqrt{2n+4} &= \sqrt{3n} \\ (\sqrt{2n+4})^2 &= (\sqrt{3n})^2 \\ 2n+4 &= 3n \\ \boxed{4=n}\end{aligned}$$

25) Simplify:  $\frac{x^9}{3x^6} = \boxed{\frac{x^3}{3}}$