Unit 3-Assessment Review

Write the equation to model the relationship between x and y:

1. y varies inversely with x. If y=40 when x=16, find x when y=-5.

   k=640, x=-128

2. The time it takes to fly from Los Angeles to New York varies inversely as the speed of the plane. If the trip takes 6 hours at 900 km/h, how long would it take at 800 km/h?

   k=5400, t=$\frac{27}{4}$

3.

x	1	3	4	10	0.5
y	30	10	7.5	3	60

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Simplify the following expressions:

4. $\frac{x+2}{2x^2+13x+20} - \frac{x+3}{2x^2+13x+20}$

$$\frac{-1}{(2x+5)(x+4)}$$

5. $6 - \frac{x+5}{(7x-5)(x+4)}$

$$\frac{42x^2-199x-125}{(7x-5)(x+4)}$$

6. $\frac{5x+5}{5x^2+35x-40} + \frac{7x}{3x}$

$$\frac{7(x+1)}{3(x+8)(x-1)}$$

7. $\frac{3x^2+4x+1}{2x^2+7x+6} \div \frac{x^2-2x-3}{-5x^2+25x-30}$

$$\frac{-5(3x+1)(x-2)}{(2x+3)(x+2)}$$

8. $\frac{x^2+3x-28}{x^2+4x+4} \cdot \frac{x^2-5x-13}{x^2-49}$

$$\frac{x-4}{x+2}$$

9. $\frac{x^3+3x}{x^2-9} \div \frac{x^2+5x-14}{x^2+4x-21}$

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

Describe the transformation of each function below from the parent function:

10. $y = \sqrt{x-3} + 11$

    Right 3, Up 11

11. $y = -(x+3)^2 + 1$

    Left 3, Up 1, Reflected

12. $y = \frac{2}{(x-2)} - 2$

    Right 2, Down 2

13. $y = -\sqrt{x+1} - 6$

    Left 1, Down 6, Reflected

14. $y = \frac{-4}{x} - 3$

    Down 3, Reflected

15. $y = (x-4)^2 + 7$

    Right 4, Up 7

Solve the following equations for the unknown variable:

16. $\sqrt{x+3} = 5$ **x=22**

17. $-10\sqrt{x-10} = -60$ **x=46**

18. $\sqrt{2x-88} = \sqrt{\frac{x}{6}}$ **x=48**

19. $x = \sqrt{42-x}$ **x=6 &-7**

20. $-x+\sqrt{6x+19}=2$ **x=-3 & 5**

21. $x-6=\sqrt{18-3x}$ **x=3 & 6**

Simplify each of the square roots below:

22. $\sqrt{144}$ **$x=\pm 12$**

23. $\sqrt{175}$ **$x=\pm 5\sqrt{7}$**

24. $\sqrt{343}$ **$x=\pm 7\sqrt{7}$**

Use exponent properties to simplify the radical expression below:

25. $\sqrt[3]{125x^9y^{12}z^{15}}$ **$\pm 5x^3y^4z^5$**

26. $\sqrt{256a^{10}b^2}$ **$\pm 16a^5b$**

27. $\sqrt[4]{81g^{12}h^2i^{16}}$ **$\pm 3g^3h^{\frac{1}{2}}i^4$**

Rewrite the radical expression in exponential form:

28. $\sqrt[7]{(2x)^4}$ **$(2x)^{\frac{4}{7}}$**

29. $\sqrt{(10x)^2}$ **$(10x)^1$**

30. $\frac{1}{\sqrt{(3x)^5}}$ **$(3x)^{-\frac{5}{2}}$**

Rewrite each expression in radical form:

31. $(8m)^{\frac{3}{7}}$ **$(\sqrt[7]{8m})^3$**

32. $9x^{\frac{1}{2}}$ **$9\sqrt{x}$**

33. $2^{-\frac{3}{5}}$ **$\frac{1}{(\sqrt[5]{2})^3}$**

Create a graph for each function below and identify the key features:

34. $y=\frac{-1}{(x-3)}+2$

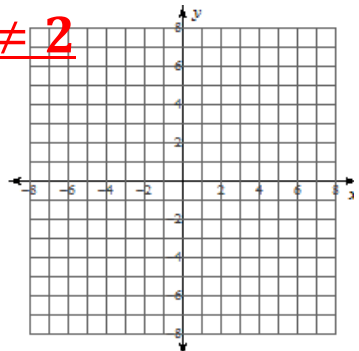
a. Describe the transformation: **Right 3, Up 2, Reflected**

b. Vertical Asymptote at: **x=3**

c. Horizontal Asymptote at: **y=2**

d. Domain: **$x \neq 3$**

e. Range: **$y \neq 2$**



35. $y=\sqrt{x+4}-5$

a. Describe the transformation: **Left 4, Down 5**

b. Domain: **$[4,\infty)$**

c. Range: **$[-5,\infty)$**

d. Increase: **$(-4,\infty)$**

e. Decrease: ***Never***

f. Max or Min @: **$(-4,-5)$**