

# 3<sup>rd</sup> Quarter Week Review

## Algebra 2 Trig.

Simplify Rational Expressions:

1.  $\frac{(-2x^3y)^2}{24x^{-5}y^{10}}$   $\frac{x^{11}}{6y^8}$

2.  $\frac{5x}{x^2+2x} - \frac{7(x)}{x^2-2x-8}$   $(x) \frac{5x-20-7x}{(x-4)(x+2)(x)} = \frac{-2x}{(x-4)(x+2)(x)}$

Find the inverse of a Function:

3.  $(x+5)^2 - 3 = y$   $f^{-1}(x) = \sqrt{x-3} - 5$

4.  $f(x) = \sqrt[3]{x+2}$   $f^{-1}(x) = x^3 - 2$

Solve Absolute Value equations/inequalities and graph on the number line:

5.  $|x-3| + 5 = 8$   $x = \{0, 6\}$

6.  $2|x+4| \leq 8$   $x \leq 0$   $x \geq -8$

Solve Rational Equations: (check for extraneous solutions)

7.  $\frac{x}{3} + \frac{x}{2} = 10$   $x = 12$

8.  $\frac{2(x+1)}{x} - \frac{6(x)}{x-1} = \frac{6}{x^2-x}$   $2x(x-1) - 6x = 6$   $x = -2$

Solve a Radical Equation:

9.  $-2\sqrt{x+3} + 5 = 11$   $x = 6$

10.  $\sqrt[3]{2x+3} + 6 = 3$   $x = -15$

Transformations:

Write the parent function for the equation

11.  $y = -2\sqrt{x-1} + 5$   $y = \sqrt{x}$

12.  $g(x) = |x-2| + 8$   $g(x) = |x|$

13. Describe the transformations from the parent function for all the equations 11-12

right 1 and up 5      right 2 and up 8

Composition of functions:

14.  $f(x) = x^2 - 9$   $g(x) = -5x + 2$

a.  $f(g(x)) = 25x^2 - 20x - 5$

b.  $g(f(x)) = -5x^2 + 47$

c.  $g(g(x)) = 25x - 8$

d.  $f(g(-4)) = 4/75$

Log form

15.  $\log_3 243 = 5$

16.  $\log_4 16 = 4$

Exponent form

$3^5 = 243$

$2^4 = 16$

System of Equations: (solve the system, write answers as an ordered pair)

17. Solve the system  $\begin{cases} y - x^2 = -3 \\ y = x + 1 \end{cases}$   $(-1.5, -0.5)$   $(2.5, 3.5)$

18. Solve the system:  $\begin{cases} y = x^2 \\ y + x^2 = 8 \end{cases}$   $x = \pm 2$   $y = 4$

Simplifying i:

19. Identify all expressions that is equivalent to  $-i$

$i^3$	$-i^3$	$i^4$
$i^{87}$	$-(i^{90})$	$i^{50}$

20. Regression: (a) Determine the best fitting regression equation for the set of data:

Angle	20	30	40	50	60	70
Distance (ft)	372	462	509	501	437	323

(b) Estimate the distance when the angle is 65. Use the regression equation from (a)

$$y = -261x^2 + 22.468x + 25.671$$

$$383,366$$

Direct/Inverse Variation: Find k and the missing value.

21. y varies directly as x. x = 2 when y = -4, find y when x = -6

$$y = 12$$

22. y varies inversely as x. x = 40 when y = 40, find x when y = -5

$$x = -32$$

23. Write an equation: z varies jointly with the square of x and inversely with the cube root of y.

$$z = kx^2 \sqrt[3]{y}$$

24. The cost per person to rent a cabin is inversely proportional to the number of people who share the rent. If the cost is \$36 per person when 5 people share, what is the cost per person when 8 people share?

$$22.5$$

Analyzing Graphs:

25. Complete the Table:

Function y=	Domain	Range	Zeros	x-intercept	y-intercept
$y =  x + 8  + 5$ 	All Reals $-2 < x < \infty$	$5 < y < \infty$	None	None	(0, 13)
$y = \sqrt{x - 2}$ 	$2 < x < \infty$	$0 < y < \infty$	{2}	(2, 0)	(0, sqrt(-2)) NONE
$y = -(x + 1)^2 - 8$ 	All Reals	$-\infty < y < -8$	$-1 \pm 2i\sqrt{2}$	None	(0, -9)
$y = 2^x - 4$ 	All Reals	$-4 < y < \infty$	{2}	(2, 0)	(0, -3)

26. Write the equation of the polynomial function with the given solutions. Also state the degree:

(a) 5, -2i

(b) 2, -3, 6, -10

$$x^3 - 5x^2 + 4x - 20$$

$$x^4 - 3x^3 - 70x^2 - 36x + 360$$

Permutations and Combinations

Evaluate:

27.  ${}_6P_2$   $360$   $30$

28.  ${}_9C_4$   $126$

29. For a segment of a radio show Dr. DJ Jamz can play 4 songs. If there are 8 to select from, in how many ways can the program for the segment be arranged?

$$8P_4 = 1680$$

30. In a Norfolk Air Race, six planes are entered and there are no ties. In how many ways can the first three finishers come in?

$$6P_3 = 120$$

31. A basketball team with 11 members chooses three captains. How many ways can the position be filled?

$$11C_3 = 165$$