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The solutions to the document are provided at the Review. For more information on Reviews or our other services please go to www.teachingcenter.ufl.edu.

- 1) Each set of numbers on the left can be described as being an example of a kind of number on the right. Match each set on the left with the kind of number that describes its members on the right.

$\{\sqrt{2}, \pi, \sqrt[9]{\pi}\}$	Real
$\{1, 2, 3\}$	Whole
$\{77, -24, \sqrt[3]{5}\}$	Natural
$\{-3, 4, 0\}$	Irrational
$\{0, 1, 2\}$	Integer

- 2) Write without absolute value bars and simplify:

$$|\pi - 7| - |4 - \pi|$$

- 3) Factor completely. Leave the expression with only positive exponents:

a) $x^2 + 5x - 36$

b) $7(3x^2 + 2)^2(1 - x^2)^2 + (3x^2 + 2)(1 - x^2)^3$

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

- 4) Simplify the Rational Expressions. State the Domain of the expression:

a)

$$\frac{x^3 - 8}{x^2 - 4} \div \frac{x^2 + 2x + 4}{x^2 + x - 2}$$

b)

$$\frac{x^{-1}}{x - y} + \frac{y^{-1}}{y - x}$$

- 5) Simplify and leave each expression with only positive exponents:

a)

$$\left(\frac{x^2y}{4z^{-1}}\right)(8x^{-2}yz^3)$$

c)

$$\sqrt[3]{\sqrt{64}}$$

b)

$$\sqrt[3]{\frac{16x^2y^{-6}z^{10}}{y^{-5}z^{-2}}}$$

d)

$$\sqrt{\sqrt[3]{320a^7b}}$$

- 6) Solve and check the solution(s):

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

- 7) Solve for the indicated variable:

a) Solve for R in...

$$\frac{1}{R} - \frac{1}{r_1} = \frac{1}{r_2}$$

b) Solve for y in...

$$\frac{3}{y-2} + \frac{1}{y+1} = \frac{1}{y^2 - y - 2}$$

- 8) Solve the inequality:

$$-2|x - 5| + 15 < -5$$

- 9) Simplify completely:

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

- 10) Factor completely:

$$8z^3 - 27z^6$$

- 11) Solve the following quadratic equations using the specified method:

- $5x^2 - 2x = 3$, by using the zero factor principal.
- $9x^2 - 12x - 14 = 0$, by completing the square.
- $5x^2 - 2x = -1$, by the quadratic formula.

- 12) Consider the points (1,3) and (7,11).

- Find the distance between the points.
- Find the midpoint of the line segment connecting these two points.
- If the points above are the endpoint of the diameter of a circle, write an equation of this circle.
- Write the equation of line, in general form, through the two points given above.
- Graph the line and the circle.

- 13) Find the center and radius of the circle given by

$$x^2 + y^2 - 6x - 10y = -30$$

- 14) What is the equation of the line, in slope intercept form, that passes through the point (-7,4) and is perpendicular to the line:

$$2x + 4y = 3$$

- 15) Consider the following function,

$$f(x) = \begin{cases} |x| & \text{if } -2 \leq x < 0 \\ 1 & \text{if } x = 0 \\ x^3 & \text{if } x > 0 \end{cases}$$

- Find the domain of the function.
- Graph the function.

- 16) Refer to the graph drawn below and determine whether each statement is true or false and discuss the continuity of $f(x)$.

- What is the domain of $f(x)$?
- What is the range of $f(x)$?
- What is $f(0)$? What is $f(4)$?
- For what values of x does $f(x) = -1$?
- On which intervals is $f(x)$ decreasing?
- On which intervals is $f(x)$ increasing?
- On which intervals is $f(x)$ constant?

