NC Math 2 — Cumulative Review #1 — Fall 2019

Name: ______________________

Show ALL Work Neatly To Receive Credit!

1) Give the coordinates of the image point under a reflection across the given line.

a. (2, -4); y-axis
b. (-5, -8); x-axis
c. (-2, 5); y = x
d. (3, -6); y = -x

a. (-2, -4)
b. (-5, 8)
c. (5, -2)
d. (6, 3)

2) Solve by factoring: $3x^2 - 10x + 8 = 0$

$(3x-4)(x-2)=0$

$3x-4=0 \quad x-2=0$

$x=2$

x = 3/4 or x = ____

3.) Solve using the Quadratic Formula: $x^2 + 11x = 2$

$x^2+11x-2$

$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$

$x = \frac{-11 \pm \sqrt{121-4(1)(-2)}}{2} = \frac{-11 \pm \sqrt{129}}{2}$

x = $\frac{-11+\sqrt{129}}{2}$ or x = $\frac{-11-\sqrt{129}}{2}$

4.) Solve by taking the square root: $4x^2 + 1 = 25$

$4x^2 = 24$

$x^2 = 6$

$x = \pm\sqrt{6}$

x = $\sqrt{6}$ or x = $-\sqrt{6}$

5.) If $\Delta UNC \sim \Delta BAD$, $UC = 15$, $BD = 90$, and $NC = 11$, what is the length of side $\overline{AD}$?

$\frac{90}{15} = \frac{x}{11}$

$990 = 15x$

$x = 66$

AD = 66

6.) A racecar completes one lap of the race in 25 seconds travelling 180 miles per hour. If the speed of the car and the time it takes to complete a lap are inversely proportional, how long would it take for the car to complete a lap if it was travelling 200 miles per hour?

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

$25 = \frac{k}{180}$

$4500 = k$

$y = \frac{4500}{x}$

$y = \frac{4500}{200}$

22.5 sec

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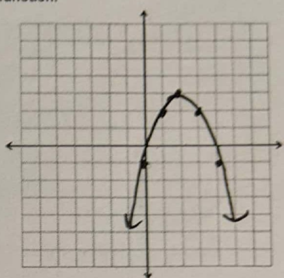
7.) For the transformed quadratic function $y = -(x-2)^2 + 3$:

a.) Give the equation of the parent function.
b.) List the transformations.
c.) Show the table of transformed characteristic points.
d.) Graph the transformed function.

a. $y = x^2$
b. reflect x-axis, right 2, up 3

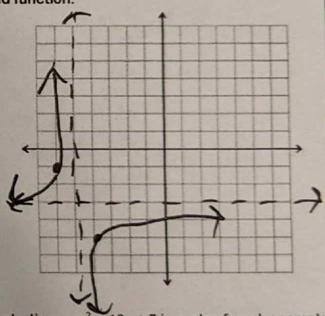
x	y
0	-1
1	2
2	3 (vertex)
3	2
4	-1



8.) For the transformed rational function $y = -\frac{2}{x+5} - 3$:

a.) Give the equation of the parent function.
b.) List the transformations.
c.) Give the equations of the asymptotes.
d.) Graph the transformed function.

a. $y = \frac{1}{x}$
b. reflect x-axis, v. stretch 2, left 5, down 3
c. HA: $y = -3$
VA: $x = -5$



9.) Place the standard form quadratic $y = x^2 - 12x + 7$ in vertex form by completing the square.

$(x^2 - 12x + 36) + 7 - 36$

$\frac{-12}{2} = -6$

$(-6)^2 = 36$

$(x-6)^2 - 29$

y = $(x-6)^2 - 29$

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Show All Work Neatly To Receive Credit

1) Write the algebraic rule each composition of transformations.

a. Reflect over y-axis; then translate up 4 and left 2.

b. Rotate 180° about the origin; then dilate by a scale factor of 4.

c. Reflect over the line y = –x; then rotate –90° about the origin.

d. Dilate by a scale factor of 0.4; then translate right 5 down 1.

a. (x,y) → ________
b. (x,y) → ________
c. (x,y) → ________
d. (x,y) → ________

2) Solve using an appropriate method: $2x^2 + 10 = 8x$ $2x^2 - 8x + 10$

$x = \frac{8 \pm \sqrt{64 - 4(2)(10)}}{2(2)}$ $\frac{8 \pm 4i}{4} = \frac{2 \pm i}{1}$

$x = \frac{8 \pm \sqrt{-16}}{4}$

x = 2+i or x = 2-i

3.) Solve: $\sqrt{2x + 8} + x = 0$

$-x \quad -x$

$(\sqrt{2x+8})^2 = (x)^2$

$2x + 8 = x^2$

$-2x \; -8 \quad -2x - 8$

$0 = x^2 - 2x - 8$

$0 = (x - 4)(x + 2)$

x = 4   x = -2 ↑ E.S.

x = 4

4.) Solve: $\frac{5}{x+1} = \frac{2}{x-8}$

$5(x - 8) = 2(x + 1)$

$5x - 40 = 2x + 2$

$-2x \quad -2x$

$3x - 40 = 2$

$3x = 42$

$x = 14$

x = 14

5.) Factor the quadratic $10x^2 - 24x + 8$

$2(5x^2 - 12x + 4)$

$2(5x - 2)(x - 2)$

2(5x-2)(x-2)

	5x	-2
x	$5x^2$	-2x
-2	-10x	4

-12x

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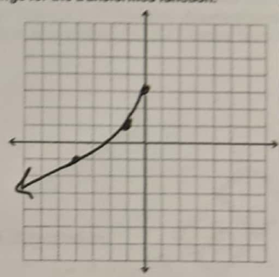
6.) For the transformed radical function $y = -2\sqrt{-x} + 3$:

a.) Give the equation of the parent function.
b.) List the transformations.
c.) Show the table of transformed characteristic points.
d.) Graph the transformed function.
e.) Give the domain and range for the transformed function.

x	y
-9	-3
-4	-1
-1	1
0	3

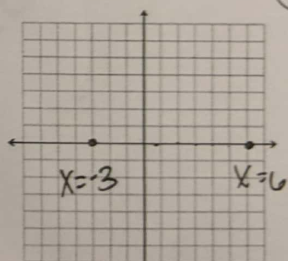


a. $\sqrt{x}$
b. reflect (x-axis)
V. stretch 2
ref. y-axis
up 3
e. Dom: $(-\infty, 0]$
Rng: $(-\infty, 3]$

7.) Recall that a parabola can have up to 2 *x-intercepts*, or *roots*. The factored form of a quadratic equation gives the roots of a quadratic.

a.) Come up with two roots, and write your own factored form equation for a parabola with those roots.
b.) Use box method or double distribution to rewrite your equation in standard form.
c.) Complete the square to write the standard form equation in vertex form.
d.) Use the vertex form and the roots from the factored form to graph your parabola.

a. y = (x + 3)(x - 6)
b. y = x² - 3x - 18
c. y = (x - 1.5)² - 20.25



x = -3 x = 6

(x + 3)(x - 6)

↓

$x^2 - 3x - 18$

$(x^2 - 3x + 2.25) - 18 - 2.25$

$\frac{-3}{2} = (-1.5)^2 = 2.25$

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