Student: _____	Instructor: Allison Amico	Assignment: MPA-4 2017
Date: _____	Course: Algebra II	

I pledge that I will not use any notes, text, or other reference materials during this assignment. I pledge that I will neither give nor receive any aid from any other person during this assignment, and that the work presented here is entirely my own.

Signature _____ Date _____

1. Solve the rational equation. If the equation has no solution, so state.

$$\frac{5}{x-5} - \frac{7}{x-1} = \frac{20}{x^2-6x+5}$$

Select the correct choice below and, if necessary, fill in the answer box within your choice.

- ○ **A.** x = _____ (Use a comma to separate answers as needed.)
- ○ **B.** There is no solution.

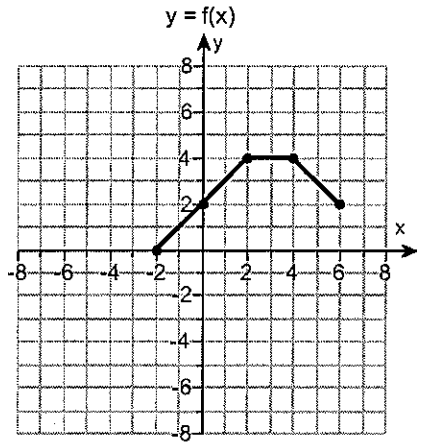
2. Solve the equation.

$$\frac{4}{y} + \frac{3}{4} = \frac{7}{4y}$$

Select the correct answer below and, if necessary, fill in the answer box to complete your choice.

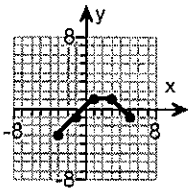
- ○ **A.** y = _____ (Use a comma to separate answers if needed.)
- ○ **B.** There is no solution.

*3. Use the graph of y = f(x) to graph the function g(x) = f(x − 1) + 3.

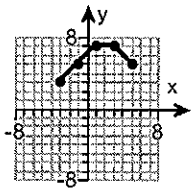


Choose the correct graph of g below.

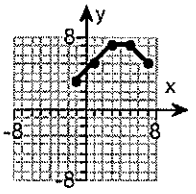
○ **A.**



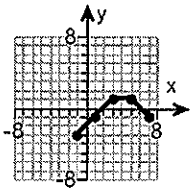
○ **B.**



○ **C.**



○ **D.**



4. Find the value of each variable.

$$\begin{bmatrix} 12 & 6 \\ 16 & 7.5 \end{bmatrix} = \begin{bmatrix} 4x-4 & 7-10t \\ 4x & 15t+1.5x \end{bmatrix}$$

$x =$ _____ (Simplify your answer. Type an integer or a decimal.)

$t =$ _____ (Simplify your answer. Type an integer or a decimal.)

5. Solve the following equation. Check your solution.

$$\frac{5}{x+1} = \frac{x+2}{x+1}$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

○ **A.** $x =$ _____ (Simplify your answer. Use a comma to separate answers as needed.)

○ **B.** No solution

6. Write the expression shown below in radical form.

$$x^{\frac{1}{5}}$$

$x^{\frac{1}{5}} =$ _____

(Simplify your answer, including any radicals. Use integers or fractions for any numbers in the expression.)

7. Find the following product.

$$\begin{bmatrix} -3 & -2 \\ -6 & -1 \end{bmatrix}\begin{bmatrix} 5 & 2 \\ 6 & 6 \end{bmatrix}$$

Select the correct choice below and, if necessary, fill in the answer boxes within your choice.

○ **A.** The product is $\begin{bmatrix} \_\_\_\_ & \_\_\_\_ \\ \_\_\_\_ & \_\_\_\_ \end{bmatrix}$. (Simplify your answers.)

○ **B.** The product is not defined.

8. Simplify the expression shown below.

$$\sqrt{3}\left(\sqrt[6]{3}\right)$$

$\sqrt{3}\left(\sqrt[6]{3}\right) =$ _____

(Simplify your answer, including any radicals. Use integers or fractions for any numbers in the expression.)

9. Solve.

$$z + \frac{3}{z} = -4$$

Select the correct choice below and, if necessary, fill in the answer box within your choice.

- **A.** The solution is z = _____. (Use a comma to separate answers as needed.)
- **B.** There is no solution.

10. Solve the equation.

$$\frac{4r-4}{r^2+4r-21} + \frac{4}{r+7} = \frac{2}{r-3}$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- **A.** r = _____
  (Type an integer or a simplified fraction. Use a comma to separate answers as needed.)
- **B.** There is no solution.

11. Use synthetic division and the given factor to completely factor the polynomial function.

$x^3 + 8x^2 + 4x - 48;\ x + 6$

$x^3 + 8x^2 + 4x - 48 = (x + 6)$_____ (Factor completely.)

12. Find the product 5C.

$$C = \begin{bmatrix} 2 & -9 \\ 2 & 4 \end{bmatrix}$$

Select the correct choice below and, if necessary, fill in the answer boxes within your choice.

- **A.** $5C = \begin{bmatrix} \_\_\_\_\_ & \_\_\_\_\_ \\ \_\_\_\_\_ & \_\_\_\_\_ \end{bmatrix}$ (Simplify your answers.)
- **B.** The product is not defined.

13. Solve the equation. Check each solution.

$$\frac{y}{2} + \frac{y}{3} = 5$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- **A.** The solution is y = _____.
  (Type an integer or a simplified fraction. Use a comma to separate answers as needed.)
- **B.** There are infinitely many solutions.
- **C.** There is no solution.

14. The optimal height h of the letters of a message printed on pavement is given by the formula $h = \frac{0.00252d^{2.27}}{e}$. Here d is the distance of the driver from the letters and e is the height of the driver's eye above the pavement. All of the distances are in meters. Find h for the given values of d and e.

$d = 91.8$ m $\quad e = 1.4$ m

$h \approx$ _____ m
(Round to the nearest tenth as needed.)

15. Solve the matrix equation.

$$X - \begin{bmatrix} 3 & 2 \\ -5 & 2 \end{bmatrix} = \begin{bmatrix} 4 & -4 \\ 2 & 0 \end{bmatrix}$$

$$X = \begin{bmatrix} \_\_\_\_\_ & \_\_\_\_\_ \\ \_\_\_\_\_ & \_\_\_\_\_ \end{bmatrix}$$

16. Divide using long division. Check your answer.

$$\left(3x^2 - 4x + 5\right) \div (x - 2)$$

The quotient is _____ with remainder _____.

17. Use synthetic division and the Remainder Theorem to find P(a).

$$P(x) = 3x^3 - x^2 + 9x + 3;\ a = \frac{1}{3}$$

$P\left(\frac{1}{3}\right) =$ _____ (Simplify your answer. Type an integer or a fraction.)

18. Find the product of the following matrices, if possible.

$$\begin{bmatrix} -8 & 8 & 2 \\ -8 & -8 & -2 \end{bmatrix} \begin{bmatrix} -6 \\ -5 \\ -7 \end{bmatrix}$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

○ **A.** $\begin{bmatrix} -8 & 8 & 2 \\ -8 & -8 & -2 \end{bmatrix} \begin{bmatrix} -6 \\ -5 \\ -7 \end{bmatrix} = \begin{bmatrix} \_\_\_\_\_ \\ \_\_\_\_\_ \end{bmatrix}$

○ **B.** The product is not possible.

19. Find 2A + 3B.

$$A = \begin{bmatrix} 7 & 9 \\ 4 & 1 \end{bmatrix} \quad B = \begin{bmatrix} -1 & 4 \\ 9 & -8 \end{bmatrix}$$

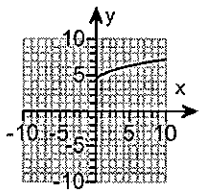
$$2A + 3B = \begin{bmatrix} \_\_\_\_\_ & \_\_\_\_\_ \\ \_\_\_\_\_ & \_\_\_\_\_ \end{bmatrix}$$

*20. Use transformations of $f(x) = \sqrt{x}$ to graph the following function.

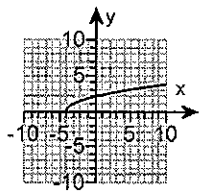
$$g(x) = \sqrt{x} - 4$$

Choose the correct graph below.

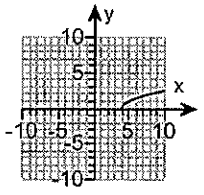
○ A.



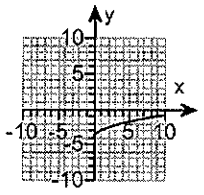
○ B.



○ C.



○ D.



21. Rewrite the expression with rational exponents.

$$\sqrt[4]{x^5}$$

$\sqrt[4]{x^5} =$ _____

22. Use synthetic division and the remainder theorem to find P(a).

$$P(x) = x^3 + 4x^2 - 5x + 1;\ a = 4$$

P(a) = _____
(Simplify your answer.)

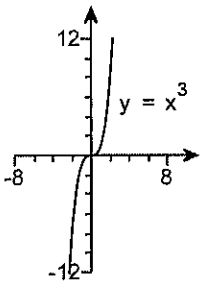
23. Divide using synthetic division.

$$\left(x^4 - 6x^2 - 26\right) \div (x + 2)$$

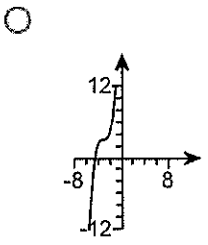
The quotient is _____ and the remainder is _____.
(Simplify your answers. Do not factor.)

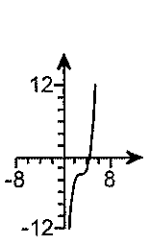
*24. Graph the function using the techniques of shifting, compressing, stretching, and/or reflecting. Start with the graph of the basic function shown below.

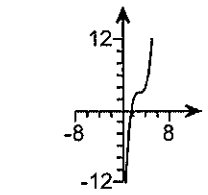
$f(x) = (x-3)^3 + 3$

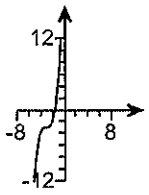


Choose the correct graph of f(x).









25. Simplify the sum. State any restrictions on the variable.

$$\frac{7y+7}{y-3} + \frac{8y+9}{y-3}$$

Select the correct choice below and fill in the answer box(es) to complete your choice.

- **A.** $\frac{7y+7}{y-3} + \frac{8y+9}{y-3} =$ _____ for all values of y
  (Simplify your answer.)
- **B.** $\frac{7y+7}{y-3} + \frac{8y+9}{y-3} =$ _____ for $y \neq$ _____
  (Simplify your answers. Use a comma to separate answers as needed.)

26. Divide.

$$\left(x^5 + 32\right) \div (x+2)$$

The quotient is _____ with a remainder of _____.
(Simplify your answers. Use integers or fractions for any numbers in the expression. Do not factor.)

27. Solve the following equation. Check the solution.

$$\frac{16}{p} + \frac{6p-5}{p+2} = 6$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- **A.** The solution is _____.
  (Type an integer or a simplified fraction. Use a comma to separate answers as needed.)
- **B.** There are infinitely many solutions.
- **C.** There is no solution.

28. Determine whether the given binomial is a factor of $x^3 + 8x^2 + 7x - 31$.

$x + 3$

Is the binomial $x + 3$ a factor of $x^3 + 8x^2 + 7x - 31$?

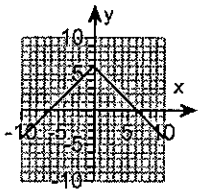
- ○ No
- ○ Yes

*29. Use transformations of $f(x) = |x|$ to graph the following function.

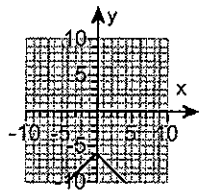
$h(x) = -|x - 6|$

Choose the correct graph below.

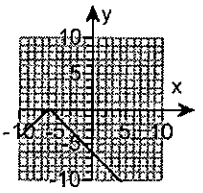
○ A.



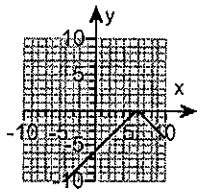
○ B.



○ C.



○ D.



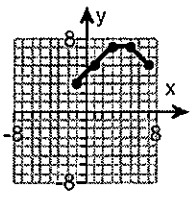
30. Divide using synthetic division.

$$\frac{3x^3 + 8x^2 - 9x + 3}{x - 3}$$

$\frac{3x^3 + 8x^2 - 9x + 3}{x - 3}$ = _____, remainder _____

1. B. There is no solution.

2. A. $y =$ **−3** (Use a comma to separate answers if needed.)

3. 

C.

4. 4

0.1

5. A. $x =$ **3** (Simplify your answer. Use a comma to separate answers as needed.)

6. $\sqrt[5]{x}$

7. A. The product is $\begin{bmatrix} \frac{-27}{-36} & \frac{-18}{-18} \end{bmatrix}$. (Simplify your answers.)

8. $\sqrt[3]{3^2}$

9. A. The solution is $z =$ **−3, −1** . (Use a comma to separate answers as needed.)

10. A. $r =$ **5** (Type an integer or a simplified fraction. Use a comma to separate answers as needed.)

11. $(x - 2)(x + 4)$

12. A. $5C = \begin{bmatrix} \frac{10}{10} & \frac{-45}{20} \end{bmatrix}$ (Simplify your answers.)

13. A. The solution is $y =$ **6** .
(Type an integer or a simplified fraction. Use a comma to separate answers as needed.)

14. 51.4

15. 7

−2

−3

2

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16. $3x + 2$

9

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17. 6

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18. A. $\begin{bmatrix} -8 & 8 & 2 \\ -8 & -8 & -2 \end{bmatrix} \begin{bmatrix} -6 \\ -5 \\ -7 \end{bmatrix} = \begin{bmatrix} \mathbf{-6} \\ \mathbf{102} \end{bmatrix}$

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19. 11

30

35

−22

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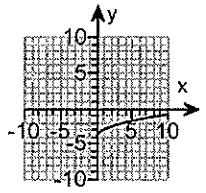
20. 

D.

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21. $x^{5/4}$

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22. 109

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23. $x^3 - 2x^2 - 2x + 4$

−34

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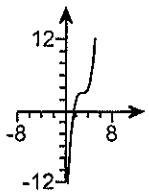
24. 

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25. B. $\frac{7y+7}{y-3} + \frac{8y+9}{y-3} = \frac{\mathbf{15y+16}}{\mathbf{y-3}}$ for $y \neq$ **3**

(Simplify your answers. Use a comma to separate answers as needed.)

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26. $x^4 - 2x^3 + 4x^2 - 8x + 16$

0

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27. A. The solution is **32**.

(Type an integer or a simplified fraction. Use a comma to separate answers as needed.)

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28. No

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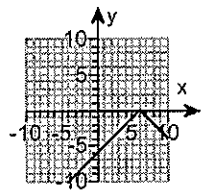
29. 

D.

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30. $3x^2 + 17x + 42$

129
