

## **Summer Assignment (Not required, but you will be quizzed on the material)**

### **Course Title: MTH 161/2 - Precalculus**

**Teacher names: Ms. Barnes and Ms. Carr**

#### **Teacher contact information:**

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#### **Purpose of Assignment:**

This dual enrollment course will allow students to earn 1 high school credit and 6 Northern Virginia Community College credits. For many students this is the first grade that will be on a college transcript, and the Math department wants the students to be as successful as possible for this course.

The assignment is designed to allow you to review the material previously covered in math courses so that you will be well prepared with several ideas that occur throughout the Precalculus course.

#### **Estimated time to complete Assignment:**

4-6 hours

#### **Due date and method of assessment for Assignment:**

This assignment will not be collected for a grade, but there will be a quiz covering the material during the 2<sup>nd</sup> week of the year. Only students who complete all the problems with work shown by the date of the quiz will be eligible for a retake of the quiz. **You are expected to be able to complete all of the questions without the use of a graphing a calculator (non-graphing calculators are fine).**

#### **Instructions for Assignment:**

All work must be done neatly on your **own paper**. Make sure each page of your work is labeled with the corresponding Worksheet Number and Topic Name. Answers to problems must be circled to facilitate grading. Most importantly, the work should be neat! Remember this assignment is not collected for a grade, but only students who complete the assignment will be able to retake the quiz.

**The Assignment and Help Videos can be found in the 2021-2022 Dual Enrollment summer assignment canvas course. If that canvas course is not available to you, email [susan.carr@apsva.us](mailto:susan.carr@apsva.us) to be enrolled.**

**Even though you should be able to complete all the questions without the use of a graphing calculator it is suggested that you have your own graphing calculator (TI-83 or TI-84) for this course.**

We look forward to seeing you!

Ms. Barnes and Ms. Carr

## MTH 161/2 – Precalculus Summer Assignment

### Worksheet # 1 – Exponent Rules

Simplify the expression to only have positive exponents. Assume that all variables are nonzero real numbers.

1.  $x^2 \cdot x^3$

2.  $(2k^3)(-4k^4)(3k^{-2})$

3.  $(-2x^3)^2$

4.  $-(2x^3)^2$

5.  $(-2x^2)^3$

6.  $-(2x^2)^3$

7.  $x^{-3}$

8.  $4x^{-3}$

9.  $\frac{3}{x^{-2}}$

10.  $\frac{-5}{x^{-4}}$

11.  $\frac{x^8}{x^2}$

12.  $\frac{x^3}{x^6}$

13.  $\frac{x^{-3}}{4x^5}$

14.  $\frac{-10x^{15}}{5x^{-3}}$

15.  $x^2 \cdot x^{-2}$

16.  $x^0$  (see #15)

17.  $\left(\frac{4x^2}{5y}\right)^3$

18.  $(3y^2)(2y^{21})$

19.  $(4x^3y^2)(-3xy)$

20.  $(-2st^5)(-4st^{-3})$

21.  $(5a^2b^3)(a^{-2}b)$

22.  $\left(-\frac{a^{-3}}{3a^{-1}b}\right)^4$

23.  $\frac{3}{4d} \cdot \frac{(2d)^4}{c^3}$

24.  $y^0(8x^6y^{-3})^{-2}$

25.  $(5r^5)^3 \cdot r^{-2}$

26.  $\frac{(3x)^{-3}y^4}{-x^2y^{-6}}$

27.  $\frac{12x^8y^{-7}}{(-4x^2y^{-6})^2}$

28.  $\left(\frac{2f^2g^3}{3fg}\right)^4$

29.  $\frac{1}{8x^{-2}y^4}$

30.  $\frac{3}{8m^5} \cdot \left(\frac{m^4}{n^2}\right)^3$

## MTH 161/2 – Precalculus Summer Assignment

### Worksheet #2 – Factoring

Directions 1-10: Perform the multiplication.

- |                            |                               |
|----------------------------|-------------------------------|
| 1. $3(5x + 1)$             | 2. $-12(3w - 2)$              |
| 3. $(y - 1)(y + 5)$        | 4. $3(x - 3)^2$               |
| 5. $(2x + 9)(3x - 4)$      | 6. $(4x + 1)(4x - 1)$         |
| 7. $2(x^2 + 3)(x - 2)$     | 8. $(x - 1)(x + 1)(x - 6)$    |
| 9. $(z - 3)(z^2 + 3z + 9)$ | 10. $(2x + 3)(4x^2 - 6x + 9)$ |

Directions 11-34: Factor the expression completely

- |                                     |                              |
|-------------------------------------|------------------------------|
| 11. $15x + 3$ (hint see #1)         | 12. $8x^5 + 4x^3$            |
| 13. $y^2 + 4y - 5$ (hint: see #3)   | 14. $x^2 - 2x - 15$          |
| 15. $n^2 + 10n + 25$                | 16. $g^2 - 18g + 81$         |
| 17. $2x^2 - 4x - 30$ (hint see #14) | 18. $-3z^2 + 12z + 36$       |
| 19. $6x^2 + 19x - 36$ (hint see #5) | 20. $2w^2 - 5w - 3$          |
| 21. $2x^2 + 7x - 30$                | 22. $5x^2 - 32x + 12$        |
| 23. $12w^2 + 51w + 12$              | 24. $24y^2 + 64y + 42$       |
| 25. $16x^2 - 1$ (hint see #6)       | 26. $54x^2 - 8$              |
| 27. $x^4 - 16$                      | 28. $81y^4 - 1$              |
| 29. $x^3 - 6x^2 - x + 6$ (see #8)   | 30. $2x^3 - 8x^2 + x - 4$    |
| 31. $10x^3 + 5x^2 - 4x - 2$         | 32. $z^3 - 27$ (hint see #9) |
| 33. $125x^3 + 1$                    | 34. $64y^3 + 27$             |

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### Worksheet #3 – Rational Expressions

Simplify the expression, and list all excluded values from the domain of the expression.

1.  $\frac{3}{5} + \frac{5}{6}$

2.  $\frac{3}{x+2} + \frac{5}{x+4}$

3.  $\frac{7}{12} - \frac{2}{5}$

4.  $\frac{7}{x-6} - \frac{1}{x+3}$

5.  $\frac{3}{2} + \frac{5}{4} - \frac{7}{5}$

6.  $\frac{2}{x^2-4} - \frac{x}{x+2} + \frac{5x}{x-2}$

7.  $\frac{3x}{x^2-1} + \frac{2}{x-1}$

8.  $\frac{3}{x^2-3x-10} - \frac{2}{x^2+3x+2}$

9.  $\frac{-18}{6x^2-x-1} + \frac{3x}{2x-1} - \frac{4x}{3x+1}$

10.  $\frac{3}{x-1} + \frac{5}{x+3} - \frac{7}{x-6}$

11.  $\frac{12}{36}$

12.  $\frac{x^3-x^2-42x}{2x^2-20x+42}$

11.  $\frac{3}{5} \cdot \frac{5}{6}$

12.  $\frac{x+6}{x+5} \cdot \frac{5}{x+6}$

13.  $\frac{4}{x^2-1} \cdot \frac{x+1}{x+6}$

14.  $\frac{3x^2+18x}{x+6} \cdot \frac{6x^2}{3x}$

15.  $\frac{8x^2-24x}{16x^3-48x^2} \cdot \frac{40x^3+56x^2}{5x^2-43x-70}$

16.  $\frac{20x^2-100x}{x-1} \cdot \frac{1}{16x^3-80x^2}$

17.  $\frac{3}{5} \div \frac{6}{5}$

18.  $\frac{x-4}{x^2-2x-8} \div \frac{1}{x-5}$

19.  $\frac{x^2-2x-15}{8x+20} \div \frac{2}{4x+10}$

20.  $\frac{3x^2-25x-18}{27x+18} \div \frac{5x-3}{5x^2-33x+18}$

21.  $\frac{10x^2-28x+16}{2x-4} \div \frac{25x^2-25x+4}{5x^2-41x+8}$

22.  $\frac{10x^2+42x+36}{6x^2-2x-60} \div \frac{40x+48}{3x^2-13x+10}$

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### Worksheet #4 – Solving

Solve the equation and give all solutions (real and complex). If no solutions are possible, then write no solutions. Some equations may require the quadratic formula. Give all solutions in simplest radical form.

1.  $27 = 3c - 3(6 - 2c)$

2.  $40 + 14j = 2(-4j - 13)$

3.  $-3 = 12y - 5(2y - 7)$

4.  $\frac{m}{5} = \frac{m-6}{4}$

5.  $-\frac{2}{3} = \frac{4v+1}{2v+14}$

6.  $\frac{c-8}{-2} = \frac{11-4c}{11}$

7.  $|4c+5| = 7$

8.  $|14-m| = 6$

9.  $-3|5g+1| - 6 = -9$

10.  $|9-4n| = 5$

11.  $3x^2 - 27 = 0$

12.  $7c^2 = 100$

13.  $x^2 = 12x - 36$

14.  $-10 = r^2 - 10r + 12$

19.  $6z^2 = 2z^2 + 7z + 5$

20.  $-4y^2 - 3y + 3 = 2y + 4$

21.  $3g^2 - 6g - 14 = 3g$

22.  $2x^2 - 7 = x$

23.  $(x+13)^2 = 25$

24.  $3(x+3)^2 = 27$

25.  $4(x+5)^2 + 20 = 12$

26.  $x^4 + 4x^2 - 5 = 0$

27.  $x^4 - 5x^2 - 14 = 0$

28.  $15x^4 + 7x^2 = 2$