

## Entering Precalculus Math Packet

Parents and Students,

This summer you are encouraged to continue to practice your math at home. This can be accomplished through regular math practice. This math packet is intended to be completed over the summer break and turned in the first day of school. In order for this to be a successful review packet please follow the following rules:

- Show all required work
- If worksheets are printed, you may write your work on the printed sheet
- If worksheets are not printed, head each paper with the name of the worksheet
- Please keep all work neat and legible, circle or box final answers
- If you need help, view Khan Academy
- It is okay to ask parents or older siblings for help
- If all else fails, send a message to the math teacher through Remind Code @sumhelptcm

There are select answers provided at the end of the packet. This is meant to check your answers and not to be a substitute for working through the problems. Each problem that requires work shown should show all the steps. Any problems that require work that do not show the steps will not be graded.

Multiplying Polynomials  
No Calculator!!!

1.  $(x+7)^2$

2)  $(x-11)^2$

3.  $(x+4)^3$

4.  $(x+h)^3$

5.  $(x+1)(x^2-3x-4)$

6.  $(x+h)(x^2+3xh+8)$

7.  $(a+b)^2$

Factoring  
No Calculator!!

Factor each polynomial completely. If the polynomial cannot be factored write prime.

1)  $2x^2 - 128$

2)  $x^2 - 10x + 24$

3)  $a^3 - 64b^3$

4)  $5x^2 + 40x - 10$

5)  $2x^2 - 11x + 12$

6)  $x^3 + 16x^2 + 64x$

7)  $x^3 + 3x^2 - 4x - 12$

8)  $24x^2 - 54$

9)  $6x^3 - 18x^2$

10)  $5c^2 + 4cd - d^2$

11)  $27y^3 + 125$

12)  $20x^2 - 4x - 72$

13)  $-x^2 + 100$

14)  $4x^4 - 64$

15)  $a^4 - 2a^2 + 1$

16)  $9x^3 + 12x^2 - 45x$

17)  $n^2 - 2n - np + 2p$

18)  $24x^2 + 4x - 60$

Adding and Subtracting Fractions  
No Calculator!!!

Simplify each expression.

1.  $\frac{2}{3} + \frac{5}{7}$

2.  $\frac{1}{6} - \frac{5}{18}$

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

4.  $\frac{3x}{4y} - 7$

5.  $\frac{3}{x^2} - \frac{4}{x}$

6.  $\frac{x}{x+5} + \frac{7x}{x^2-25}$

7.  $\frac{6}{5x} + \frac{4}{9x} - \frac{1}{3x}$

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

9.  $\frac{x}{x^2-9} + \frac{5}{4x-12}$

10.  $\frac{5x}{x-5} + \frac{x+5}{x+2}$

11.  $\frac{3}{x+3} - \frac{4}{3x}$

Multiplying and Dividing Fractions  
No Calculator!!!

Simplify each expression.

$$1. \frac{4}{5} \cdot \frac{2}{3}$$

$$2. \frac{1}{9} \cdot -\frac{3}{7}$$

$$3. \frac{\frac{2}{7}}{\frac{4}{9}}$$

$$4. \frac{\frac{11}{7}}{-\frac{7}{18}}$$

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

$$6. \frac{\frac{x}{5}}{3}$$

$$7. \frac{4}{13} \cdot \frac{x}{7}$$

$$8. \frac{x+2}{5x} \cdot \frac{-7}{4x}$$

$$9. \frac{11}{10} \cdot 9x$$

$$10. \frac{\frac{8}{3x}}{\frac{5x}{7}}$$

$$11. \frac{\frac{7x+2}{5x-3}}{\frac{9x+4}{6x+7}}$$

$$12. \frac{\frac{x}{2}}{\frac{5}{5}}$$

$$13. \frac{\frac{y}{z}}{7}$$

$$14. \frac{2 + \frac{3}{7}}{4 - \frac{1}{7}}$$

Remember you can not cancel at the beginning!!!

$$15. \frac{1 + \frac{1}{x}}{1 - \frac{1}{x}}$$

$$16. \frac{\frac{x}{3} - 4}{\frac{x}{3} + 7}$$

Rationalize the denominator  
No Calculator!!

1)  $\frac{2}{3-\sqrt{2}}$

2)  $\frac{\sqrt{7}}{\sqrt{3}+4}$

3)  $\frac{4+\sqrt{3}}{2-\sqrt{3}}$

4)  $\frac{2+\sqrt{2}}{6+\sqrt{2}}$

5)  $\frac{3i-2}{5i-3}$

6)  $\frac{6-i\sqrt{2}}{6+i\sqrt{2}}$

7)  $\frac{3+7i}{7i}$

Solve Quadratic Equations

No Calculator!!

**Find all real and imaginary solutions for all problems.**

Solve the following by factoring.

1)  $x^2 = 3x + 4$

2)  $9x = 10x^2$

3)  $8x^2 + 2x = 1$

4)  $x(x-5) = 36$

5)  $(x-6)(x-8) = 24$

Solve the following by using the square root property.

6)  $3x^2 + 2 = 0$

7)  $(x+5)^2 - 12 = 0$

8)  $(2x-5)^2 = -11$

9)  $5(4x-3)^2 = 30$

10)  $\frac{(y+4)^2}{2} = 18$

Solve the following by completing the square.

11)  $x^2 + 10 = 8x$

12)  $x^2 - 5x + \frac{41}{4} = 0$

13)  $2x^2 + 16x + 39 = 0$

Solve the following using the Quadratic Formula. You should have the Quadratic Formula memorized.

14)  $3x^2 = 2 - 9x$

15)  $5x^2 - 2x = -4$

16)  $12x^2 = x + 6$

Find the domain of functions

No Calculator!!

State the domain of each function using interval notation.

1)  $f(x) = \sqrt{2x-5}$

2)  $f(x) = \frac{x}{5-x}$

3)  $f(x) = 4x+5$

4)  $f(x) = 3x^2 - 4x + 9$

5)  $f(x) = \frac{x}{x+4}$

6)  $f(x) = \sqrt{-2x+5}$

7)  $f(x) = \frac{1}{3x^2 - 27}$

8)  $f(x) = \frac{1}{x^2 - 10x + 24}$

Rational Equations  
No Calculator!!!

Remember the quadratic formula!!!  
Solve each rational equation.

1.  $\frac{x}{x-3} = \frac{2}{5}$

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

3.  $\frac{2}{x} + \frac{3x-1}{x+3} = 4$

4.  $\frac{4x-3}{x-2} = 6 - \frac{x+6}{x+2}$

5.  $\frac{2}{x+5} + \frac{6}{x^2-25} = \frac{3}{x-5}$

6.  $\frac{13x+20}{x^2+13x+42} - \frac{4}{x+6} = \frac{6}{x+7}$

## Select Answers

### Multiplying Polynomials

1)  $x^2+14x+49$

4)  $x^3+3x^2h+3xh^2+h^3$

6)  $x^3+4x^2h+3xh^2+8x+8h$

### Factoring

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

5)  $(2x-3)(x-4)$

11)  $(3y+5)(9y^2-15y+25)$

### Adding and Subtracting Fractions

1)  $29/21$

4)  $3x-28y/4y$

11)  $5x-12/3x^2+9x$

### Multiplying and Dividing Fractions

1)  $8/15$

5)  $-2/15$

9)  $99x/10$

11)  $-42x^2-61x-14/45x^2-7x-12$

### Rationalize the Denominator

1)  $6+2\sqrt{2}/7$

4)  $5+2\sqrt{2}/17$

7)  $7-3i/7$

### Solve Quadratic Equations

1)  $-1, 4$

6)  $\pm i\sqrt{6}/3$

10)  $10, -2$

### Find the domain of the Function

1)  $\left[\frac{5}{2}, \infty\right)$

6)  $\left(-\infty, \frac{5}{2}\right]$

8)  $(-\infty, 4) \cup (4, 6) \cup (6, \infty)$

### Rational Equations

1)  $-2$

4)  $\frac{9 \pm \sqrt{105}}{2}$

6)  $44/3$