Name: _____ Pre-Calculus 2017

Summer Math Packet for students entering Pre-Calculus

Over the summer to better prepare you for the challenges of Pre-Calculus next year, we have put together some worksheets for you to complete over the summer. The packet will be due the first day back to school in the fall.

The worksheets will cover the following topics:

Review Sheet 1 – Equation Solving
Review Sheet 2 – Factoring
Review Sheet 3 – Linear Functions
Review Sheet 4 – Quadratics
Review Sheet 5 – Inequalities and Absolute Values
Review Sheet 6 – Exponents and Logarithms

Completing this packet:

- ✓ Assignments will be passed in on the **FIRST** day of school and will count towards your homework grade for Quarter 1.
- ✓ You will be **TESTED** on this information during the first week of school.
- ✓ All of this information will relate to Pre-Calculus. It is imperative that you know each concept to be successful during the class.
- ✓ For each individual problem you should:
  - Read Directions
  - Show ALL work
  - Leave answers as REDUCED FRACTIONS. No decimal answers should be given!
  - NO WORK=NO CREDIT!

Good Luck! We hope you have a wonderful summer! See you in the fall!!

Solve the following equations, check all answers to verify your solution. SHOW ALL WORK!

1. $-2(x+4)-3=7$

2. $6(2x-1)=3(x-3)+7$

3. $\frac{1}{2}+\frac{x}{3}=\frac{7}{6}$

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

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

6. $0.4(x-1)+1=0.5x$

7. A rectangular fence has a length of 10 feet. Its width is half its length. Find the perimeter of the fence and the area of the rectangle it encloses.

Accelerated Questions:

Solve the following equations expressing answers in exact form.

8. $A=P+Prt$ solve for P.

9. $\pi x+3=4\pi x$ solve for π

10. $\sqrt{2}(x+1)-1=3\sqrt{2}$

11. $\frac{6}{x}-3=\frac{11}{3x}$

12. The volume of a small drum in the shape of a right circular cylinder is 10π cubic feet. The radius of the drum is 2 feet. Find the height of the drum. What is the total surface area of this drum?

Factoring

Factor completely

1. $25x^2 - 16$
2. $9x^2 - 6x + 1$
3. $x^2 - 6x - 16$
4. $3x^2 - 5x - 12$
5. $4x^2 - 23x - 6$
6. $a^2 - b^2$
7. $6x^2 + 11x - 10$
8. $18x^2 + 43x - 5$
9. $8x^2 - 61x - 24$

Factor out the Greatest Common Factor (GCF) first, then factor the trinomial.

10. $6x^3 - 15x^2 + 9x$
11. $4x^4 + 20x^3 + 24x^2$

Factor by Grouping

12. $3(x-2) + x(x-2)$
13. $2x^3 - 5x^2 - 6x + 15$

Accelerated Questions:

Factor over the set of complex numbers (use imaginary *i when necessary*)

14. $81x^4 - 16y^8$
15. $a^3 + b^3$
16. $8ax - 2ay - 12bx + 3by$
17. $8x^3 - 1$
18. $240x^3 - 1610x^2 + 570x$
19. $x^2 + 9$

Linear Functions

Calculate the slope of the line containing the points:

1. $(4,1) and\ (2,3)$
2. $(-3,4) and\ (3,-4)$
3. $(2,7) and\ (2,-9)$
4. $(4,-3) and\ (-7,-3)$

Write an equation for the line with the given properties. Express answer in y = mx + b form:

5. containing the points (-2,4) and (2,12)
6. Vertical through the point (-3,6)
7. Horizontal through the point (4,-8)
8. Parallel to y=2x+7 and having the point (2,-4)
9. The line containing the points (a, 4) and (-3, 2) has a slope of 3. Find the value of a

Accelerated Questions:

10. Write an equation for the perpendicular bisector to the line segment having endpoints at (-1,4) and (3, -2). Express answer in standard form (Ax + By = C where A,B,C are integers, A>0)

Quadratics

Solve the following quadratic equations using the Quadratic Formula. Give exact, simplified answers.

1. $x^2 + 4x = 7$

2. $x^2 + 3x - 7 = 0$

Solve the following quadratic equations by Factoring

3. $(2x - 1)(3x + 2) = 0$

4. $x^2 - 7x + 12 = 0$

5. $6x^2 - x - 12 = 0$

Simplify the following complex expressions. Express answers in a + bi form.

6. i^{57}

7. $\sqrt{-4} + \sqrt{-9}$

8. $\sqrt{-4}\sqrt{-9}$

9. $\frac{\sqrt{-16}}{\sqrt{-1}}$

10. $7(2 - i) - (3 + 8i)$

11. $(2 + 3i)(-4 + i)$

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

Accelerated Questions:

13. The quadratic function $f(x) = ax^2 + 4x + 2$ contains the point (-1,2). Find the value of a.

Solve the following equations.

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

15. $\sqrt{2x + 1} - x = -1$

16. $x^2 - x + 5 = 0$

Inequalities and Absolute Values

Solve the following inequalities.

1. $3x + 5 > 2 - 3x$

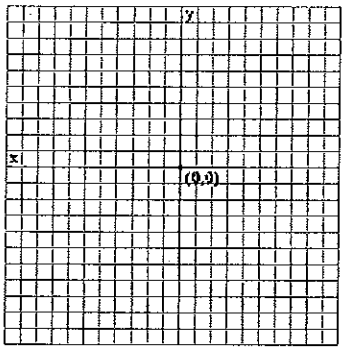
2. $-2 < 7x + 5 < 19$

3. $|2x - 7| \geq 5$

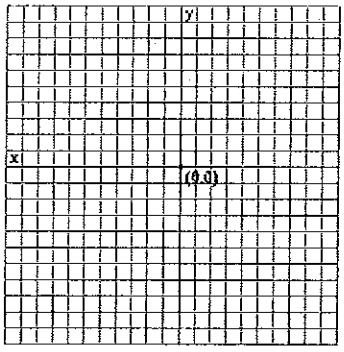
4. $4|3 - 7x| - 2 < 6$

Sketch the graph of:

5. $y \geq 3x + 2$



6. $y < x^2$



Accelerated Questions:

Solve the following inequalities.

7. $-\frac{3}{5}\left(\frac{4}{9}r - \frac{25}{12}\right) \leq \frac{9}{5}\left(2r + \frac{11}{9}\right)$

8. $-\frac{1}{2}\left|-1 - \frac{3}{2}x\right| + \frac{3}{2} > \frac{1}{2}$

9. $3(x - 5) - 5x < -7x + 4 < x - 1$

Exponents and Logarithms

Simplify the following expressions using positive exponents:

1. $(3x^5y^6z^{-3})(2xy^{-4}z)$
2. $(4x^2y^{-7}a)^2$
3. $\frac{9x^5y^2z}{3x^{-5}yz^{-3}}$
4. $\left(\frac{3x^5+7x}{5-7x^{-3}}\right)^0$
5. $3x^{-2}(x^5y^{-7})^3$
6. $\left(\frac{x^6yab^{-2}}{ab^6}\right)^{-2}$

Evaluate the following with a calculator, round all answers to the nearest hundredth

7. $\log 8$
8. $\log_3 8$
9. $10^{\log 3}$
10. $e^{\ln 7}$
11. $\ln(\log 25)$

Accelerated Questions:

12. At what rate (to the nearest hundredth of a percent) would an account have to pay in order to have \$5000 grow to \$7000 if compounded weekly for six years?

13. If you double a penny every nine days, how much will you have in 15 weeks?