Summer Math

In preparation for **Pre-Calculus**, we have prepared a review of concepts for summer review. These are concepts that students have been taught in previous math classes and problems they should know how to do. This packet does not require you to use a calculator; in fact *you should not use a calculator at all on any of these problems.* Pre-Calculus builds on the concepts in this packet. We start teaching Pre-Calculus concepts on the first day of school. We expect you to know the concepts in the packet in order to help you be successful in Pre-Calculus.

If you are struggling with this work get help from a friend, parent, or tutor. If you cannot find someone to help you, there are tutors available. A list of tutors can be found by calling Glenn High School. Keep in mind these tutors may charge a fee. Additionally, you may find websites can be helpful if you search for information on the topics at the top of the page. While you may get help, you *are* expected to do your own work.

You will have a graded assignment within the first two weeks of school. The graded assignment will cover all the concepts in the packet, but will not be the exact same problems. The graded assignment will be completed without a calculator.

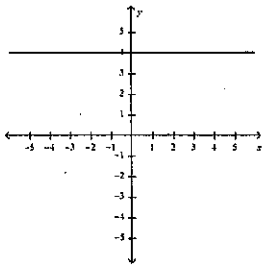
Student Name

_____

PARENT FUNCTIONS: Write the letter of the function and the number of the graph in the blank under the name of the appropriate model.

a. $f(x) = a$
b. $f(x) = \frac{(x^2+1)(x-2)}{(x+1)(x-2)}$
c. $f(x) = x^3$
d. $f(x) = \log_a x$
e. $f(x) = x$
f. $f(x) = x^2$
g. $f(x) = [x]$
h. $f(x) = a^x$
i. $f(x) = \sqrt[3]{x}$
j. $f(x) = \sqrt{x}$
k. $f(x) = \frac{1}{x}$
l. $f(x) = \sin x$
m. $f(x) = \cos x$
n. $f(x) = |x|$

1.



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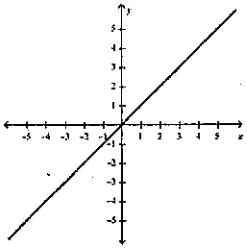

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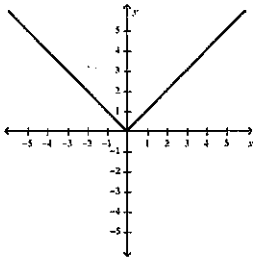

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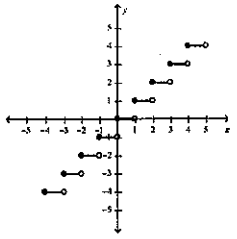

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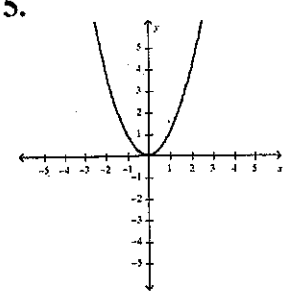

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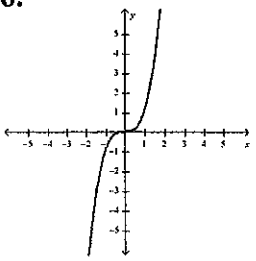

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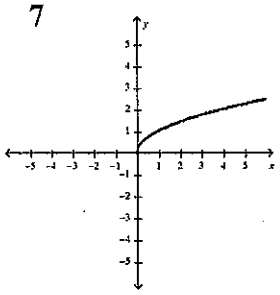

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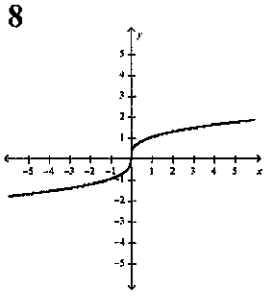

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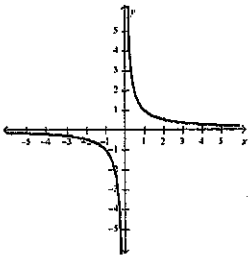

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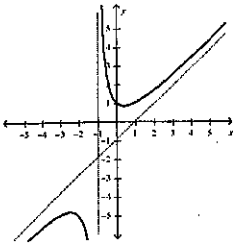

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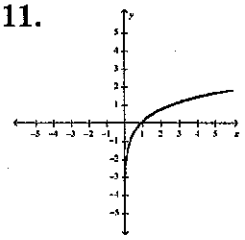

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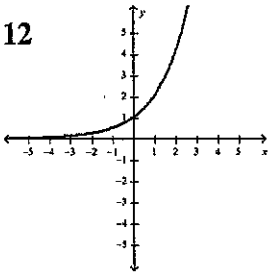

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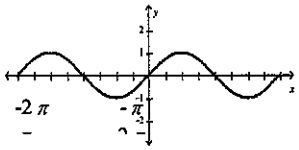

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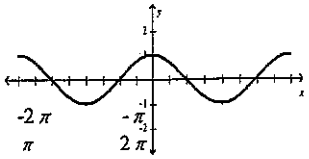


Absolute Value	Constant	Cubic	Cube Root	Exponential
_____	_____	_____	_____	_____
Greatest Integer	Linear	Logarithmic	Quadratic	Rational
_____	_____	_____	_____	_____
Reciprocal (Inverse Power)		Square Root	Trigonometric (two functions)	
_____		_____	_____	_____

Calculus Name _____

ordinate Geometry: *Distance, Midpoint, Standard Form Equation of Circle*

etermine the quadrant(s) in which (x, y) is located so that the condition(s) is (are) satisfied.

1. $x < 0$ and $y < 0$ _____

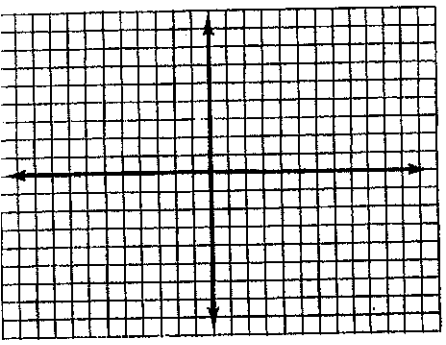
2. $x > 4$ _____

3. $x > 2$ and $y = 3$ _____

4. $(-x, y)$ _____

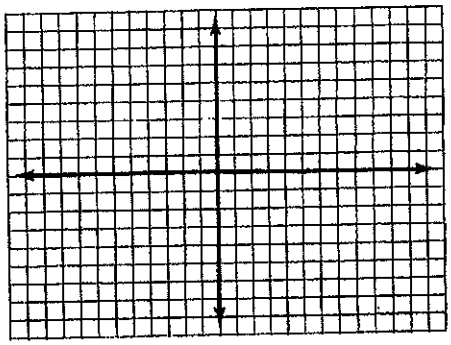
Plot the points. Find the midpoint of the segment that joins the points. Find the distance between the points.

5. (1, 8), (6, 0)



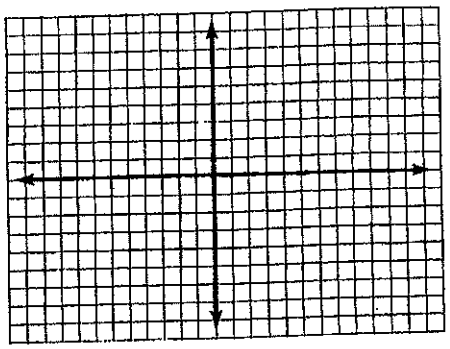
_____ _____

6. (-4, 7), (4, -5)



_____ _____

7. (-7, - 4), (2, 8)



_____ _____

Find the midpoint of the segment that joins the points. Find the distance between the points.

8. $\left(\frac{1}{2}, 1\right), \left(\frac{-5}{2}, \frac{4}{3}\right)$

_____ _____

9. $\left(\frac{-1}{3}, \frac{-1}{3}\right), \left(\frac{-1}{6}, \frac{-1}{2}\right)$

_____ _____

10. (6.2, 5.4), (-3.7, 1.8)

_____ _____

Find the standard form of the equation for the circle described.

11. center (0,0); radius 5

12. Center $(0, \frac{1}{3})$; radius $\frac{1}{3}$

13. center (3, -1); point on the circle (-1, 1)

14. Endpoints of a diameter (- 4, -1), (4, 1)

Find the center and radius of the circle whose equation is given.

15. $x^2 + y^2 = 16$

16. $x^2 + (y - 1)^2 = 4$

17. $(x - \frac{2}{3})^2 + (y + \frac{1}{4})^2 = \frac{25}{9}$

Multiplying Polynomials
No Calculator

1. $(x+7)^2$ 2. $(x-11)^2$ 3. $(x+4)^3$ 4. $(2x+3)^2$ 5. $(x+1)(x^2-3x-4)$

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

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

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

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

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

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

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

Remember you can ***not*** cancel at the beginning. (*Simplify the numerators and denominators first.*)

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

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

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

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

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

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

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

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

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

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

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

Domain of a Function
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) $f(x)=\frac{1}{x^2-10x+24}$

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

Solve the following by completing the square.

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

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

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) $12x^2 = x + 6$

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

Logarithms
No Calculator

1-2 Write each equation in logarithmic form.

1. $4^2 = 16$

2. $5^{-3} = \frac{1}{125}$

3-4 Write each equation in exponential form.

3. $\log_3 81 = 4$

4. $\log_{49} 7 = \frac{1}{2}$

Evaluate each expression.

5. $\log 100$

6. $\log_2 32$

7. $\log_3 \frac{1}{81}$

8. $\log_{64} 4$

9. $\log_5 5^8$

Solve each equation.

10. $\log_7 x = 3$

11. $\log_8 (5x - 11) = 2$

12. $\log_x 6 = \frac{1}{2}$

13. $\log_3 \frac{1}{27} = x$

14. $\log_4 x + 3 = \log_4 (5x^2)$

15. $\log 125 = 3 \log x$

16. $2\log_9 3 - \log_9 5 = \log_9 x$

17. $\log_4 x + \log_4 2 = 3$

18. $\log_3 (x+1) - \log_3 (x-1) = 4$