Pre-Calculus Summer Assignment

For those students who will be taking Pre-Calculus during the upcoming academic year.

General Instructions:

A) All answers must be clearly written on the provided answer sheet.

B) Unless otherwise noted, All answers must be
- All radicals must be stated in simplified radical form.
- All decimals must be accurate to the thousandths place.
- All fractions must be written as reduced mixed numbers

C) All work must be attached on separate white lined paper.
- Work must be legible and organized.
- Work needs to be numbered.
- **No work, will result in NO credit for the assignment**.

Fill in the blank with the appropriate word from the list below. Some words may be used more than once and others might not be used at all.

{Absolute value, Composite, Dependent, Discriminant, Identity, Independent, Matrix}

1) A number's distance from zero is its _____1)_____.
2) In the function y = f(x), y is the _____2)_____ variable
3) _____3)_____ linear systems have many solutions
4) A(n) is a rectangular array of numbers
5) A matrix is the inverse of another matrix if their product is the ____4)_____ matrix.
6) The _____5)_____ completely determines the type of roots of a quadratic function.
7) If g(x) = x – 4 and h(x) = x^2, g(h(x)) = x^2 – 4 is an example of a ____6)_____ function.

Evaluate each expression given the value of the variable.

8) 6c + 3d – 5c + 2d + 4c; c = 4 and d = 1

9) $\left(\frac{r^2 - s^2}{r + s}\right)^2 ; r = \frac{1}{2}$ and s = -2

Simplify each expression.

10) 5m + 3n + 8m – 7n

11) $\left(\frac{x^3 y^2 z^5}{x y^6 z^5}\right)^3$

Solve each equation for the indicated variable.

12) y = mx + b; for m

13) $l = \sqrt{\frac{a}{2g + 1}}$; for g

State the solution to each inequality using the indicated notation.

14) 5x + 2 > 22; Set notation

15) 3 < 2x-1 ≤ 11; Graph notation

16) |x – 2| ≤ 6; Interval notation

Use points A(-1,6) and B(3,4) to answer the following:

17) Find the slope of AB.

18) Find the length of segment AB.

Use slope intercept form to write the equation of the line:

19) Perpendicular to $y = \frac{2}{5}x + 4$ and passing through (6,-2).

20) Passing through the points (5,6) and (7,10).

For the function f(x) = 3x -5 and g(x) = x^2 + 1, find each.

21) f(3) 22) g(3) 23) (f + g) (3) 24) f(x+h) 25) g(f(c))

Identify the parent function, sketch the graph and identify any transformations.

26) f(x) = x^2 + 1 27) g(x) = $\sqrt{x-3}+2$ 28) h(x) = -|X+2| +1

29) Find $g^{-1}(x)$ {Don't sketch the graph.}

Simplify each expression and rationalize all denominators. Assume all variables are positive.

30) $\sqrt{144}$ 31) $\sqrt[4]{7^4}$ 32) $\sqrt{10}\cdot\sqrt{40}$

33) $\sqrt{27}+\sqrt{75}-\sqrt{12}$ 34) $\frac{\sqrt[3]{81a^8b^5}}{\sqrt[3]{3a^2b}}$ 35) $\frac{\sqrt{2}}{1-\sqrt{5}}$

Solve each equation for all possible values of the variable.

36) |x-7| = 20 37) $\sqrt{x+7} = x+1$ 38) $\sqrt[3]{3x+1} = -5$

Solve each system of equations.

39) $-y = -4$
$3x - 6y = -12$

40) $y = x - 2$
$x + 5y = 20$

41) $x - y + z = -2$
$4x - y + 2z = -3$
$2x - 3y + 2z = -7$

Given the matrices $A = \begin{bmatrix} 3 & -2 \\ 1 & 5 \end{bmatrix}$ $B = \begin{bmatrix} 5 & 7 \\ 4 & -8 \end{bmatrix}$**. Find each of the following.**

42) A – B 43) A + 2B 44) AB

Find the roots of each equation by factoring.

45) $x^2 - x - 12 = 0$ 46) $x^2 - 5x = 0$

Write a quadratic equation in standard form for the given sets of zeros.

47) 3 and -1 48) 4 and 5

Find all real and imaginary roots for each equation.

49) f(x) = x^2 – 3x – 8 50) g(x) = x^2 -10x + 37

Write each result in the form, a + bi.

51) $(3 + i) - (1 + 5i)$ 52) $(3 + i)(1 + 5i)$ 53) i^{37} 54) $\frac{1+5i}{3+i}$

Simplify by doing the indicated operation.

55 $(7p^3 - 5p^2 + 3p - 2) - (p^3 + 4p - 10)$ 56) $(r + 2)(r^2 - 3r + 5)$

57) $(3x^3 + 11x^2 + 2x - 16) \div (x + 2)$

Applications

58) Roast beef has 25g of protein and 11g of calcium per serving. A serving of mashed potatoes has 2g of protein and 25g of calcium. How many servings of each are needed to supply exactly 29g of protein and 61g of calcium?

59) An English sonnet is made up of 14 lines of text. Rebecca is working on a poetry project for her English class that must be at least 100 lines long. Rebecca has already written 61 lines of haiku, free-verse poems, and limericks, and she plans to write the rest in sonnet form. What is the minimum number of sonnets she must write to complete the project?

Name: _____ Period: _____

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1) _____

2) _____

3) _____

4) _____

5) _____

6) _____

7) _____

8) _____

9) _____

10) _____

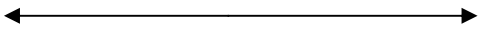
11) _____

12) m = _____

13) g = _____

14) _____

15)



16) _____

17) m=_____

18) _____

19) Y=_____

20) Y= _____

21) _____

22) _____

23) _____

24) _____

25) _____

26) _____

_____

Sketch on next page.

27) _____

_____

Sketch on next page.

28) _____

_____

Sketch on next page.

29) _____

30) _____

31) _____

32) _____

33) _____

34) _____

35) _____

36) _____

37) _____

38) _____

Name: _____ Period: _____

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Answer Sheet

39) (x =___, y =_____)

40) (x =___, y =_____)

41) (x =___, y =_____, z =_____)

42) _____

43) _____

44) _____

45) _____

46) _____

47) _____

48) _____

49) _____

50) _____

51) _____

52) _____

53) _____

54) _____

55) _____

56) _____

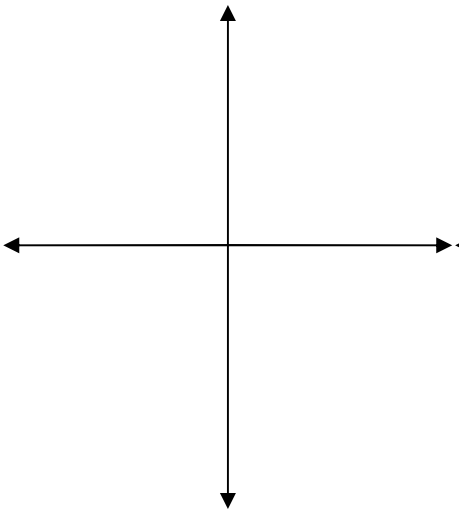
57) _____

58) _____

59) _____

Graphs

26)



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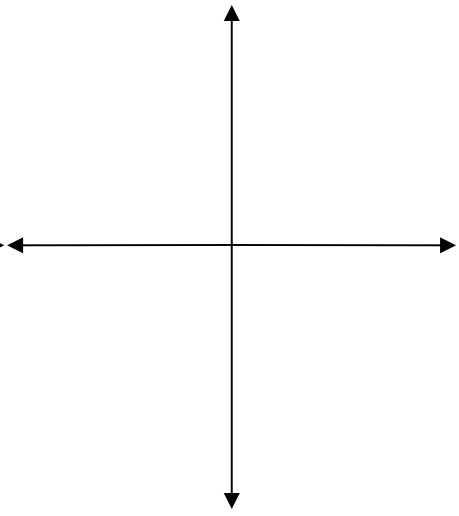

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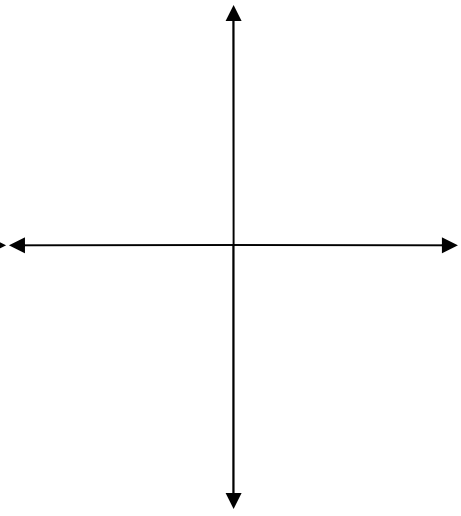

All work must be attached to these answer sheets.