Course Number (when applicable)
MA 320 (Precalculus) MA 340 (Honors Precalculus w Analysis) MA 355 (Honors Precalculus with Differential Calculus)

Course Title
Precalculus/H. Precalculus with Analysis/H. Precalculus with Differential Calculus

Name of Assignment (title of book(s), Author, Edition, and ISBN (when applicable)
Precalculus: Graphical, Numerical, Algebraic, Demana et. al, 7th edition, ISBN 0-13-227650-X

Expectations/Instructions for Student When Completing Assignment
Read carefully and answer what is asked. Use your calculator, but write exact answers whenever possible, making sure to simplify answers. Include your work as well as the final solution. If you have forgotten any topic, you may use Khan Academy online to refresh your memory.

One Essential Question for Assignment
How can you be an effective and resourceful problem solver?

One Enduring Understanding for Assignment
A problem solver understands what has to be done, knows why the process was appropriate, and can support it with reasons and evidence, given that the ability to solve problems is the heart of mathematics.

Parent Role and Expectations
Parents should serve as a supportive resource by checking in with their daughter to make sure the packet has been completed by the start of school.

Estimated Time Requirement
Varied by student pace and knowledge.

Summer Packet for Students taking
Honors Precalculus and Honors Precalculus with Differential Calculus**

(** There is an extra section at the end you must complete – more fun!)

1. $\sqrt[3]{-125} =$

2. $\left(2x^2\right)\left(3x^3\right) =$

3. Solve for n: $\dfrac{5}{n} - \dfrac{3}{n} = \dfrac{1}{4}$

4. Solve for x: $\dfrac{x}{3} + \dfrac{5}{6} = 2$

5. If $f(x) = 2x^3 - 3x^2 - x + 2$ then $f(-1) =$

6. If $\dfrac{3}{3k+x} = \dfrac{1}{k+1}$, and $k \neq -1$, then x =

7. Determine the lowest common denominator for these:
$\dfrac{1}{s^2 + s - 12}$ and $\dfrac{1}{s^2 - 5s + 6}$

8. Solve this system: $\begin{array}{l} 2x + y = 7 \\ x - 4y = 4 \end{array}$

9. If $m = \sqrt{3}$ then $m^{-4} =$

10. Simplify: $\dfrac{1}{y} + \dfrac{2}{3+y} =$

11. Solve: $3x^2 - x - 4 = 0$

12. If $\dfrac{a^2}{r+t} = m$ and $m \neq 0$, then r =

13. Solve: $x^3 - 8x^2 = 0$

14. For what value of k is $x-1$ a factor of $3x^5 - k$?

15. If $(2,-3)$ and $(-6,9)$ are ordered pairs of real numbers of the form $(x, mx+b)$ then m =

16. $(2+i)^2 =$

17. If x and y are real numbers, and if $y = \sqrt{3x^2 - 4}$ what is the minimum value of y?

18. If $x = -3$ is one solution of the equation: $x^2 + x + c = 0$, then c =

20. Evaluate: $\log_2 8 =$

21. $\begin{vmatrix} 4 & 2 & 1 \\ 0 & 0 & 1 \\ 1 & 1 & 0 \end{vmatrix} =$

22. Solve for y: $y^4 + y^2 - y - 1 = y(y^3 - 1)$

23. What are the real numbers x, for which $x^2 - x - 1 < x^2 - 1$?

24. Every fifth degree polynomial with real coefficients must have how many real roots?

25. If $\dfrac{a}{c^2} = 5$ and $c^2 = 2ax$, then x = ?

26. If log x = log 1 + log 2 + log 3 + log 4 + log 5, then x = ?

27. Solve the system: $\begin{array}{l} y - x^2 - 5 = 0 \\ y - x = 7 \end{array}$

28. Determine all real numbers for x such that: $(x-3)(x+1) > 0$

29. If $25^x = 5$ and $3^{x+y} = 81$, then y = ?

30. If $\log_{10} n = 1.9682$, then $\log_{10} 100n = ?$

31. $\dfrac{3+2i}{i} =$

32. Simplify: $2\sqrt{12} + 3\sqrt{48} - 5\sqrt{27} =$

33. Solve: $x^2 - 7x - 12 = 0$

34. $-16^{-\frac{1}{2}} + 8^{\frac{2}{3}} =$

35. Describe the nature of the roots of : $2x^2 - x - 4 = 0$

36. What are all values of c for which $x^2 + 2x + c = 0$ has imaginary roots?

37. If $\log_b 10 = p$ and $\log_b 2 = q$, then $\log_b 20 = ?$

38. Solve: $1 + \sqrt{x^2 + 12} = 1 - \sqrt{62 - x^2}$

39. Write the quadratic equation whose roots are 4 and -3.

40. $(2i)(-2i) =$

41. If an integer x, is divided by another integer, y, the quotient is 24. If the sum of the two integers is 75, then x = ?

43. For what values of k will the roots of the equation $x^2 + kx + 9 = 0$ be equal?

44. Simplify: $i^2 + i^4 + i^6 =$

45. The graphs of two linear equations are distinct and do not intersect. How many solutions do these two equations have in common?

46. Solve: $|x - 2| < 4$

47. The graph of $5x^2 + 5y^2 = 25$ is a circle. Determine the center and the radius.

48. Solve: $2^{2x} = 64$

49. Graph: $y = 2x^2 + 3x + 2$

50. What are all the numbers which satisfy the equation: $x^2 - 5x - 14 = 0$ and also satisfy the inequality: $x > 5$?

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Determine whether the equation defines y as a function of x.
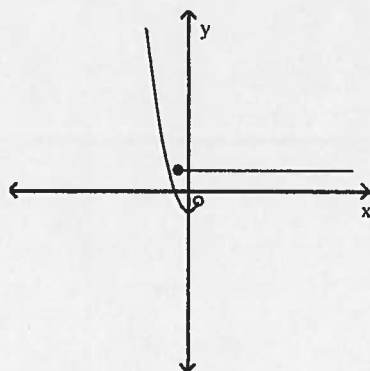
1) $y = -8x^2 - 7x - 6$

    A) No   B) Yes

1) _____

Determine whether the graph is the graph of a function.

2)

    A) Yes   B) No

2) _____

Find the domain of the given function.

3) $f(x) = \dfrac{x}{x - 7}$

    A) $(-\infty, 7) \cup (7, \infty)$ B) All real numbers
    C) $(-\infty, -7) \cup (-7, \infty)$ D) $(0, \infty)$

3) _____

4) $f(x) = \dfrac{x}{x^2 + 3x}$

    A) $(-\infty, 0) \cup (0, \infty)$ B) $(-\infty, -3) \cup (-3, 0) \cup (0, \infty)$
    C) $(-\infty, -3) \cup (-3, \infty)$ D) $(-\infty, 0) \cup (0, 3) \cup (3, \infty)$

4) _____

Find the range of the function.

5) $f(x) = (x + 1)^2 - 1$
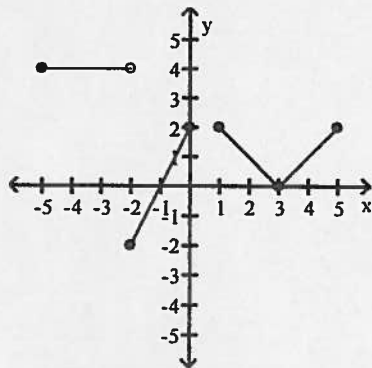
    A) $(-\infty, -1)$ B) $[-1, \infty)$ C) $[0, \infty)$ D) $(-\infty, \infty)$

5) _____

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Determine the intervals on which the function is increasing, decreasing, and constant.

6)

A) Increasing on (–2, 0) and (3, 5); Decreasing on (1, 3); Constant on (–5, –2)
B) Increasing on (–1, 0) and (3, 5); Decreasing on (0, 3); Constant on (–5, –3)
C) Increasing on (–2, 0) and (3, 4); Decreasing on (–5, –2) and (1, 3)
D) Increasing on (1, 3); Decreasing on (–2, 0) and (3, 5); Constant on (2, 5)

Determine algebraically whether the function is even, odd, or neither even nor odd.

7) $f(x) = 7x^4 + 7x + 5$

7) _____

    A) Neither   B) Odd   C) Even

8) $f(x) = \dfrac{26}{x^2}$

8) _____

    A) Even   B) Neither   C) Odd

Find the asymptote(s) of the given function.

9) $h(x) = \dfrac{(x-3)(x+3)}{x^2-1}$ vertical asymptotes(s)

9) _____

    A) $x = 1, x = -1$ B) None   C) $x = 3, x = -3$ D) $x = -3, x = 3$

10) $g(x) = \dfrac{x^2 + 8x - 9}{x - 9}$ horizontal asymptotes(s)

10) _____

    A) $y = 9$ B) $y = -8$ C) None   D) $y = 3$

1) B
2) B
3) A
4) B
5) B
6) A
7) A
8) A
9) A
10) C

Section 2 is for students taking the
Honors Precalculus with Differential Calculus

Section 2 – for students taking the Honors Precalc. With Differential Calculus course.

1. What is the value of cos x if $\sin x = \dfrac{1}{4}$ and x is an acute angle?

2. Complete the table of values: (write exact values only)

x	Sin x	Cos x	Tan x
0			
$\dfrac{\pi}{6}$			
$\dfrac{\pi}{4}$			
$\dfrac{\pi}{3}$			
$\dfrac{\pi}{2}$			
$\dfrac{2\pi}{3}$			
$\dfrac{3\pi}{4}$			
$\dfrac{5\pi}{6}$			
π			
$\dfrac{7\pi}{6}$			
$\dfrac{5\pi}{4}$			
$\dfrac{4\pi}{3}$			
$\dfrac{3\pi}{2}$			
$\dfrac{5\pi}{3}$			
$\dfrac{7\pi}{4}$			
$\dfrac{11\pi}{6}$			

3. $\sin 120° =$

4. If $0° \leq x \leq 90°$, and if tan x = sin x, then x = ?

5. An incline makes an angle of $45°$ with the level ground. How many feet up the incline must one go in order to rise 10 feet above the ground?

6. In drawing a circle with a compass, an arc 2.4 inches long is drawn each time the compass rotates through an angle of one radian. What is the radius of the circle in inches?

7. Graph each of the following from -2π to 2π :
      a. y = sin x

      b. y = cos x

      c. y = tan x

8. Write in radians: 220°

9. Write in degrees: $\dfrac{5\pi}{8}$

10. Determine the reference angle for each of the following:

      a. 300°   d. −88°

      b. 115°   e. 530°

      c. −170°

The end! Congratulations – you're done. If you have any questions you should:
a. Go back over your notes from the class you took last year.
b. Make a note of the kind of question you need help with and ask about it in your new class – right away !