

Unit 11 Pre-calculus
Chapter Homefun

Name: _____

Day 1 – Homefun Given the graph, find the limits and the value of the function.

1. $\lim_{x \rightarrow -4^-} f(x) =$ _____

2. $\lim_{x \rightarrow -4^+} f(x) =$ _____

3. $\lim_{x \rightarrow -4} f(x) =$ _____

4. $\lim_{x \rightarrow -2^-} f(x) =$ _____

5. $\lim_{x \rightarrow -2^+} f(x) =$ _____

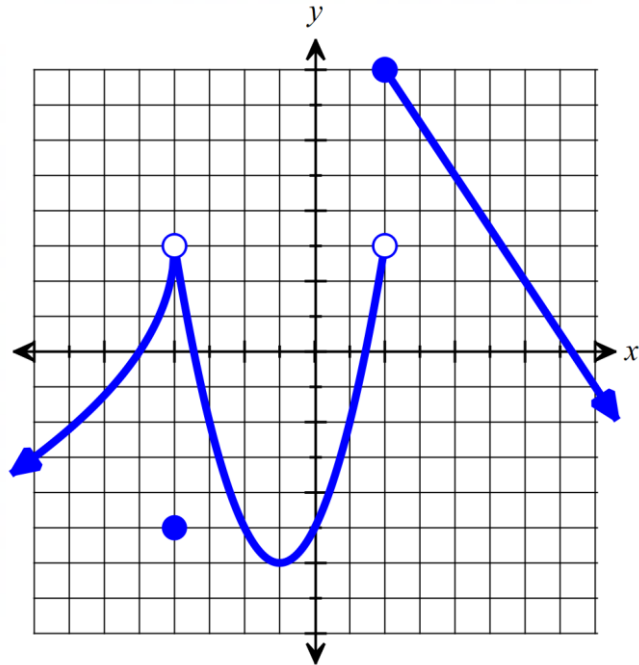
6. $\lim_{x \rightarrow -2} f(x) =$ _____

7. $f(-2) =$ _____

8. $f(-4) =$ _____

9. $f(-5) =$ _____

10. $f(4) =$ _____



Mixed Review:

Find the exact value by using a sum or difference formula.

11) $\sin(30^\circ + 45^\circ)$

12) $\cos(11\pi/12)\cos(\pi/12) + \sin(11\pi/12)\sin(\pi/12)$

13) $\sin(7\pi/12)$

14) $\cos(165^\circ)$

15) Use a power –reducing formula to reduce the power in the following: $12\sin^2 x \cos^2 x$

Day 2 Homefun – Evaluate the limits. Simplify all answers, including radicals.

1) $\lim_{x \rightarrow 0} \frac{\cos 5x}{x}$

2) $\lim_{x \rightarrow 4} \frac{2x^2 - 5x - 12}{x - 4}$

3) $\lim_{x \rightarrow 16} \frac{\sqrt{x} - 4}{x - 16}$

4) $\lim_{x \rightarrow 4} \frac{2x^2 - 32}{x^3 - 64}$

5) $\lim_{x \rightarrow 1} \frac{x^3 + 5x^2 + 3x - 9}{x - 1}$

6) $\lim_{w \rightarrow 0} \frac{2(3+w) - 6}{w}$

Mixed Review: Write your answers for a) inbetween $[0, 2\pi)$ b) All values (use k)

7) $\sin x = -\frac{\sqrt{3}}{2}$

8) $\tan x = 1$

9) $\sin^2 x - 3\sin x = 0$

10) $2\cos^2 x - \cos x - 1 = 0$

11) Solve on the interval $[0, 2\pi)$. Round to 2 decimal places

$$\cos^2 x - 4\cos x + 1 = 0$$

Day 3 Homefun –

Determine whether the function $f(x)$ is continuous at $x = 2$. Write yes or no. Show work.

$$1. f(x) = f(x) = \begin{cases} 5x + 6 & \text{if } x \neq 2 \\ 16 & \text{if } x = 2 \end{cases} \quad 1) \underline{\hspace{2cm}}$$

Determine whether the function is continuous at $x = 5$. Write yes or no. Show work.

$$2. f(x) = \begin{cases} 5x + 20 & \text{if } x < 5 \\ 9x & \text{if } x = 5 \\ x^2 + 4x & \text{if } x > 5 \end{cases} \quad 2) \underline{\hspace{2cm}}$$

3. Determine whether the function graphed in number 1 is continuous at $x = 3$. Write yes or no and explain.

For problems 4 – 6 , find the x values for which $f(x)$ is discontinuous, if there are any.

$$4) f(x) = \frac{12}{\sin x} \quad 4) \underline{\hspace{2cm}}$$

$$5) f(x) = \frac{x+2}{x^2-3x-10} \quad 5) \underline{\hspace{2cm}}$$

$$6) f(x) = \frac{10}{x \tan x} \quad 6) \underline{\hspace{2cm}}$$

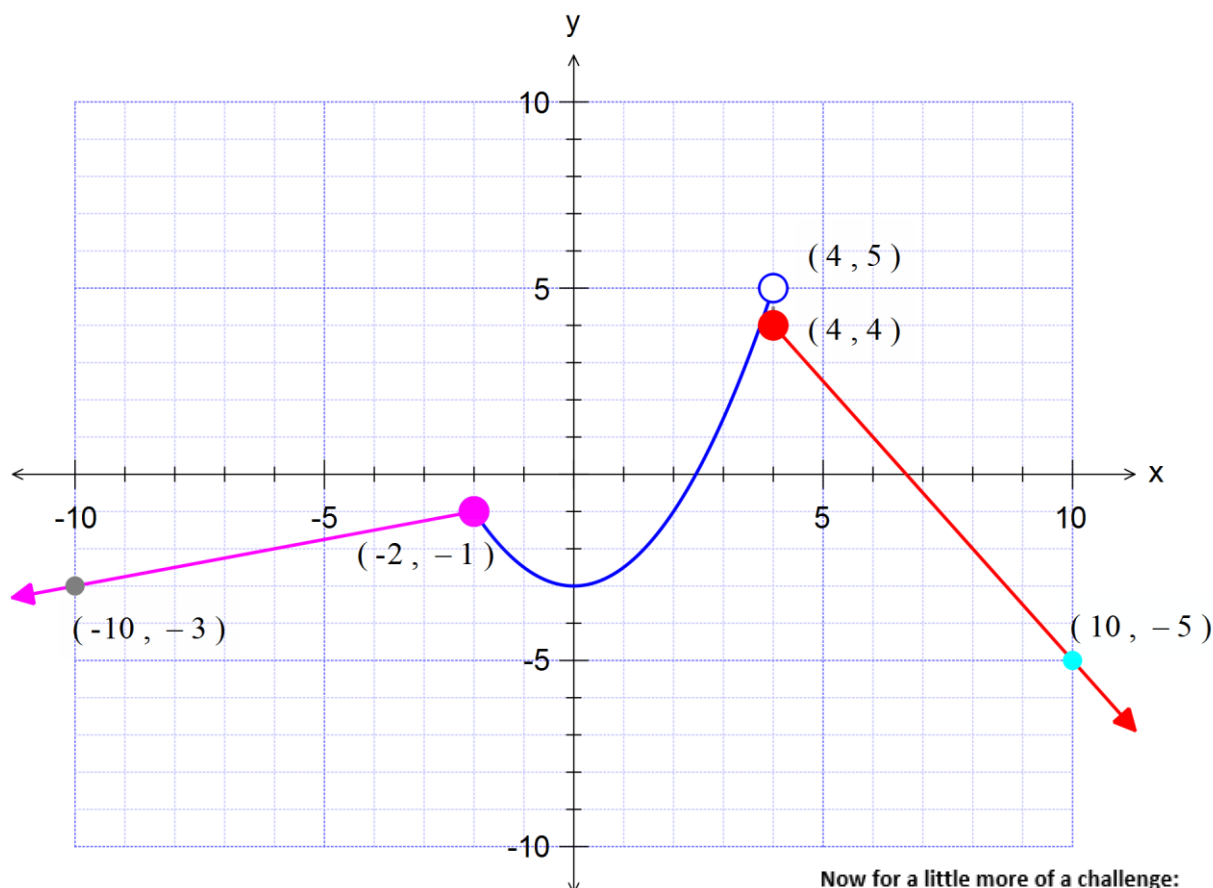
Mixed Review:

1. A plane is flying 630mph in a direction 33° north of west. Meanwhile a wind is blowing from the northeast at 30mph. Find the resulting speed and direction of the plane's flight.
2. Three forces all with manitudes of 85 newtons are acting on an object. One with a direction of $N87^\circ E$, one with a direction of $S10^\circ W$, and the one with a direction of the northwest. Find the resultant force on the object (direction and magnitude).
3. Find the dot product for $\vec{v} = 2i + 3j$ & $\vec{w} = -3i - 2j$. Then decide if they are parallel, perpendicular or neither.

Unit 13 – 11.1 – 11.3 Practice Worksheet

Limits and Function Values

1) Given the graph of $f(x)$ below:



Now for a little more of a challenge:

Find the following:

- a) $f(-6) =$
- b) $f(-4) =$
- c) $f(-2) =$
- d) $f(0) =$
- e) $f(2) =$
- f) $f(4) =$
- g) $f(6) =$
- h) $f(8) =$
- i) $f(10) =$

j) $f(-7) =$

k) $f(-2.5) =$

l) $f(2\pi) =$

Find the following:

m) $\lim_{x \rightarrow -7} f(x) =$

n) $\lim_{x \rightarrow -2.5} f(x) =$

o) $\lim_{x \rightarrow 2\pi} f(x) =$

p) $\lim_{x \rightarrow -2^-} f(x) =$

q) $\lim_{x \rightarrow -2^+} f(x) =$

r) $\lim_{x \rightarrow -2} f(x) =$

s) $\lim_{x \rightarrow 4^-} f(x) =$

t) $\lim_{x \rightarrow 4^+} f(x) =$

u) $\lim_{x \rightarrow 4} f(x) =$

Find the equations for $f(x)$ expressed as a piece-wise function in the following manner. Note that the equation for the parabolic portion of the function is given to you below. You will need to determine the equations for the two lines and determine the domains for each piece of the function:

$$f(x) = \begin{cases} mx + b & \text{domain 1} \\ \frac{1}{2}x^2 - 3 & \text{domain 2} \\ mx + b & \text{domain 3} \end{cases}$$

$$f(x) = \left\{ \begin{array}{l} \text{---} x + \text{---} \\ \frac{1}{2}x^2 - 3 \\ \text{---} x + \text{---} \end{array} \right\}$$

Evaluate the following limits.

2. $\lim_{x \rightarrow 2} \frac{3x + 4}{x + 1}$

3. $\lim_{x \rightarrow 0} \frac{\sin x}{x}$ **Hint: Graph**

4. $\lim_{h \rightarrow 0} \frac{2(3 + h) - 2(3)}{h}$

5. $\lim_{h \rightarrow 0} \frac{(x + h)^2 - x^2}{h}$

Consider the chart below.

x	1.9	1.99	1.999	2	2.001	2.01	2.1
$f(x)$	3.1	3.01	3.001	3	4.001	4.01	4.1

6. Find $f(2)$.

7. Find $\lim_{x \rightarrow 2} f(x)$. Explain your answer.

8. Sketch a graph of the function around the value $x = 2$.

Day 4 - 5 Homefun

For numbers 1 – 5, use the **definition of the derivative**. Show all work!

- 1) Find the slope of the tangent line to the graph of $f(x) = x^2$ at $(2, 4)$.

- 2) Find the slope of the tangent line to the graph of $f(x) = \sqrt{x}$ at $(9, 3)$.

- 3) Find the equation of the tangent line to the graph of $y = x^2 + x$ at $(1, 2)$. Write your answer in slope-intercept form.

- 4) Find the equation of the tangent line (in slope intercept form) to the graph of $y = 2x^3 - 4x + 1$ at $x = 1$

- 5) Find the equation of the tangent line (in slope intercept form) to the graph of $y = 3x^3 - 4x^2 + 13$ at $x = -2$.