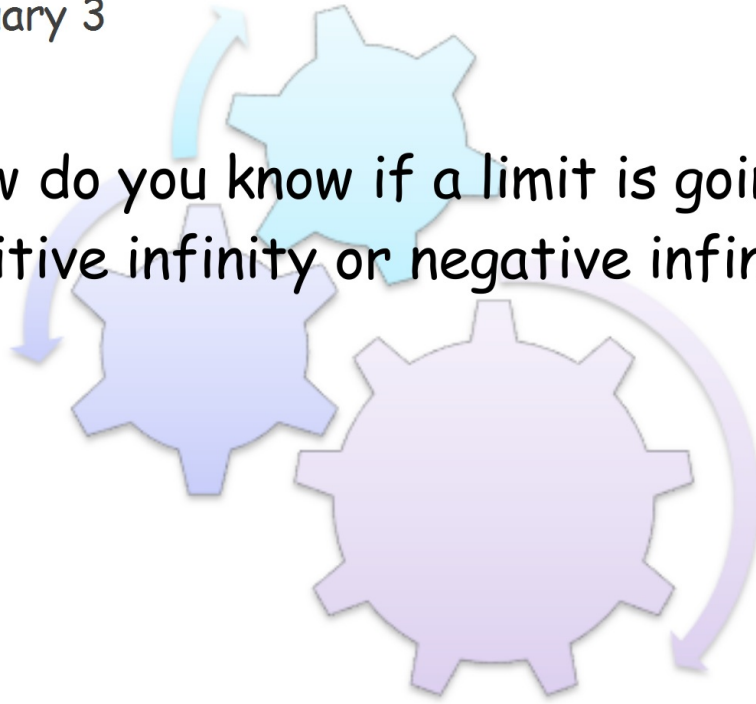


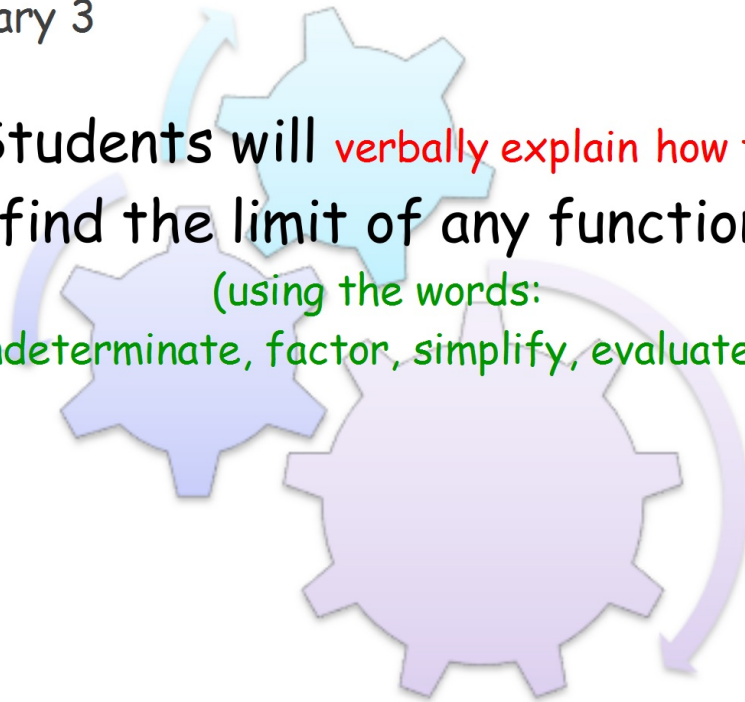
February 3

How do you know if a limit is going to positive infinity or negative infinity?



February 3

Students will verbally explain how to
find the limit of any function
(using the words:
indeterminate, factor, simplify, evaluate...)



Practice Problem Set 4:

Pg 89 #67-80

pg 94 #5-25 (odd), 45-54

Practice Problem Set 4:

Pg 89 #67-80

pg 94 #1-15, 45-54

Finding the Limit

Algebraically

substitute in
the x-value

if your answer is
real number ...

You are done!
That is your limit

if your answer is a
number divided
by zero...

Your limit is infinity...
test from right and
left

from the right - plug
in a bigger number

from the left - plug in
a smaller number

not zero
zero

an
indeterminate...

factor (or expand)
and simplify, then try
again

???

$\frac{0}{0}$

$y = \frac{x-15}{(x-3)^2}$
 find vertical
 asymptotes
 and one-
 sided limits

- (1) Set Denominator equal to zero and solve:

$$(x-3)^2 = 0$$

$$\sqrt{(x-3)^2} = \sqrt{0}$$

$$x-3 = 0 \rightarrow x=3$$

- (2) Determine the value of the numerator when the denominator is zero ($x = a$)

$$3-15 = -12 \text{ (negative)}$$

- (3) Find the limit from the left

(check the sign of the denominator using a number a little less than a)

$$\lim_{x \rightarrow 3^-} \frac{x-15}{(x-3)^2} = \frac{-12}{0}$$

$$(2.9-3)^2 = (-.1)^2 = .01$$

(positive)

$$\lim_{x \rightarrow 3^-} \frac{x-15}{(x-3)^2} = \frac{\text{negative}}{\text{positive}} = -\infty$$

- (4) Find the limit from the right

(check the sign of the denominator using a number a little ^{more} less than a)

$$\lim_{x \rightarrow 3^+} \frac{x-15}{(x-3)^2} = \frac{-12}{0}$$

$$(3.2-3)^2 = (.2)^2 = .04$$

(positive)

$$\lim_{x \rightarrow 3^+} \frac{x-15}{(x-3)^2} = \frac{\text{negative}}{\text{positive}} = -\infty$$