HW 1-7 (review) page 1

limitation WS

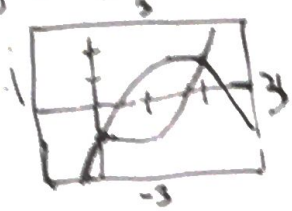
p 9-63, 69; p 18-69, 79; p 41 - 3, 9, 13, 14, 33, 39

p 72 - 79; p 84-72, 89, 89, 93; p 93 51, 53

page 9 Use calc to find intersection

(63) $y = x^3 - 2x^2 + x - 1$

$y = -x^2 + 3x - 1$

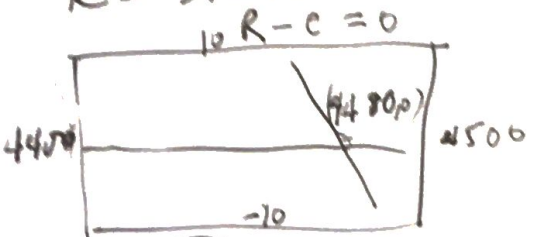


and $(0, -1)$ $(2, 1)$

(69) Find when revenue = cost

$C = 2.04x + 5600$

$R = 3.29x$



p. 17 (69) Find eq of target line of $x^2 + y^2 = 169$ at $(5, 12)$

m of radius is $\frac{12}{5}$

so $y - 12 = \frac{-5}{12}(x - 5)$

is the $\perp$ target line

p18 (79) use

$$D = \frac{|Ax_1 + By_1 + C|}{\sqrt{A^2 + B^2}}$$

to find distance b/t $(-2, 1)$ and $x - y - 2 = 0$

$$\frac{|(1)(-2) - (1)(1) - 2|}{\sqrt{(1)^2 + (-1)^2}}$$

p41 Find intercepts:

(7) $y = \frac{x-3}{x-4}$

$x - 3 = 0$ when $x = 3$

$(3, 0)$

and $\frac{0-3}{0-4} = \frac{3}{4}$

$(0, \frac{3}{4})$

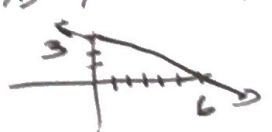
(9) Find: Intercepts, sym. Graph

$y = -\frac{1}{2}x + 3 = f(x)$

$(0, 3)$ and $(6, 0)$

$f(-x) \neq f(x)$

$f(-x) \neq -f(x)$



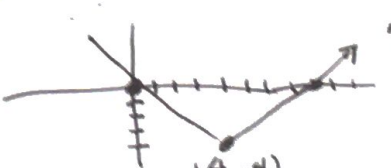
(13) $y = 2\sqrt{4 - x}$ $(4, 0)$ $(0, 4)$

$f(-x) \neq f(x)$

$f(-x) \neq -f(x)$

no sym

(14) $y = |x - 4| - 4$ $(0, 0)$ $(8, 0)$



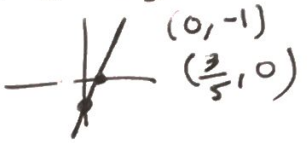
no sym.

#1-7 (Review) page 2

p41 (33) Find eq of lines that go through $(-3, 5)$ and

(a) $m = \frac{7}{16}$ $\quad y - 5 = \frac{7}{16}(x+3)$

(b) $\parallel$ to $5x - 3y = 3$ $\quad m = \frac{1}{\frac{3}{5}} = \frac{5}{3}$



so $y - 5 = \frac{5}{3}(x+3)$

(c) $\perp$ to $3x + 4y = 8$

$(0, 2)\ (\frac{8}{3}, 0)$ $\quad$ so $y - 5 = \frac{4}{3}(x+3)$

$m = \frac{-2}{\frac{8}{3}} = \frac{-6}{8} = \frac{-3}{4}$

(d) $\parallel$ to $y = 0$ $\quad m = 0$ $\quad$ so $y = 5$

(39) Evaluate & simplify

$f(x) = 4x^2$

$$\frac{f(x+\Delta x) - f(x)}{\Delta x} = \frac{4(x^2 + 2x\Delta x + \Delta x^2) - 4x^2}{\Delta x} = \frac{8x\Delta x + 4\Delta x^2}{\Delta x}$$

$$= 8x + 4\Delta x$$

p72 Find limit all 3 ways: Graph, Num, Analytic

(79) $\lim_{t \to 0} \frac{\sin 3t}{t} = \lim_{t \to 0} \frac{3 \sin 3t}{3t} = 3$ (by Th 1.19 $\lim_{x \to 0} \frac{\sin x}{x} = 1$)

x	.1	.01	.001	0	-.001	-.01	-.1
$f(x)$	2.9552	2.9996	3	?	3	2.9996	2.9552

p84 (72) Use a calc to find discont of $\frac{1}{x^2 + 2x - 15}$

find zeros of $(x+5)(x-3)$

$x = -5, 3$

(84) $f(x) = x^3 + 5x - 3$ on $[0, 1]$

since $f(0) = -3$, a neg.

and $f(1) = 3$, a post

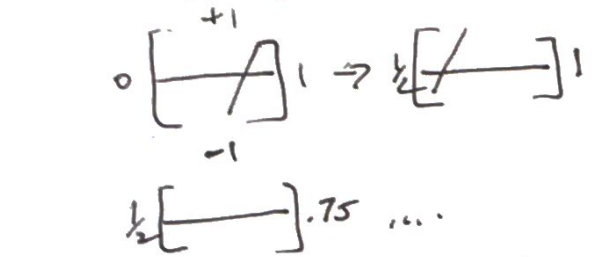
and f is continuous.

by IVT there is a $-3 < c < 3$ that $f(c) = 0$.

p84 89, 93 p93 51, 53

(89) Zoom w/IVT to find
$f(x) = x^3 + x - 1$

A cont. polynomial, so by IVT $f(0) < 0$ and $f(1) > 0$ there is a zero between 0 & 1.



....

or use zero function

$f(.6823) \approx 0$

See Ex 8 p82

(93) Root

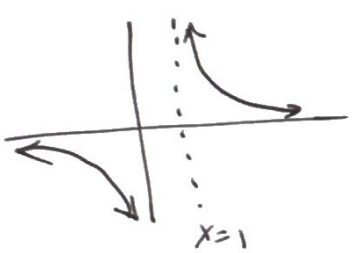
$g(t) = 2\cos t - 3t$

if you have $Y_1 = 0$
and $Y_2 = 2\cos X - 3t$
then CALC > INTERSECTION
(#5 on menu)

$g(.5636) \approx 0$

p93 (51) use graphic utility

$$\lim_{x \to 1^+} \frac{x^2+x+1}{x^3-1} = \infty$$



Analytically:

$$\lim_{x \to 1^+} \frac{(x^2+x+1)}{(x-1)(x^2+x+1)}$$

$$\lim_{x \to 1^+} \frac{1}{x-1} = \infty$$

(53) $\lim_{x \to c} f(x) = \infty$, $\lim_{x \to c} g(x) = -2$ — See Th 1.15 p.91

a. $\lim_{x \to c} [f(x) + g(x)]$

$\infty + -2 = \infty$

b. $\lim_{x \to c} [f(x) \cdot g(x)]$

$\infty \cdot -2 = -\infty$

c. $\lim_{x \to c} \frac{g(x)}{f(x)}$

$\frac{-2}{\infty} = 0$