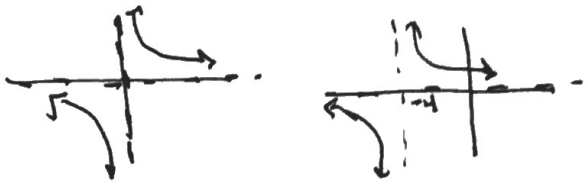
Indicators assignment 2

1.01 Ex 5 $f(x) = \frac{1}{x}$ $f(x+4)$



D: $(-\infty, 0) \cup (0, \infty)$
R: $(-\infty, 0) \cup (0, \infty)$
VA $x = 0$
HA $y = 0$

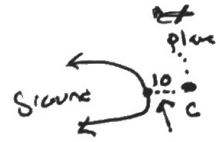
D: $(-\infty, -4) \cup (-4, \infty)$
R: $(-\infty, 0) \cup (0, \infty)$
VA $x = -4$
HA $y = 0$

$f^{-1}(x) = \frac{1}{x}$

D, R, asymp are same as $f(x)$.

1.02 Ex 5 $\frac{x^2}{100} - \frac{y^2}{4} = 1$

$\sqrt{100} = 10$



You are 10 miles from the center.

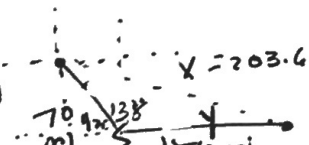
1.02 Ex 6 $\frac{y^2}{4225} + \frac{x^2}{2100} = 1$

$\sqrt{2500} = 50 \times 2 = 100$ ft - horiz. width

$25 + \sqrt{4225} = 65$

$65(2) + 25 = 155$ ft height from ground

1.03 Ex 1



$x^2 = 70^2 + 150^2 - 2(70)(150)\cos 138°$

$x = 207.4$ miles

$70^2 = 150^2 + 207.4^2 - 2(150)(207.4)\cos y$

$y = 13.1°$

He is $13.1°$ North of West

2.01 Ex 1 $M(t) = 65 \cdot \ln(1.4t + 4)$

most growth 0-1 yrs

least growth 4-5 yrs

calc. table

x	y
0	...
12	
24	
36	
48	
60	

← could look at y values in table

1.01 Ex 2

of cranks = n
t = # trees

$$n(t) = \begin{cases} 600t & t \le 20 \\ t(600 - 15(t-20)) = 300t - 15t^2 & \end{cases}$$

$t = 20 \quad 600(20)$

$n(20) = \$12{,}000$

using calc for max

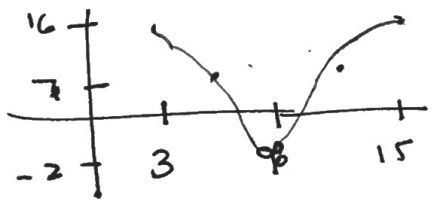
$t = 30$,

then $n(30) = \$13500$

plant 30 trees! ✓

2.02 Ex 6

(3, 16) (9, −2) (15, 16)



$pd = 12 \qquad \frac{2\pi}{k} = 12$

$\pi/6 = k$

$a = 9$

ps 3 vs 7

$$h(t) = 9\cos\left(\tfrac{\pi}{6}(x-3)\right) + 7$$

7.7 → 10.3 = 2.6 sec under water

2.5 ft above at 11 sec.

2.02 Ex 9

$$\frac{\cos(x)}{1+\sin(x)} = \sec(x) - \tan(x)$$

$$= \frac{1}{\cos x} - \frac{\sin x}{\cos x}$$

$$= \frac{(1-\sin x)(1+\sin x)}{\cos x\,(1+\sin x)}$$

$$= \frac{1-\sin^2 x}{\cos x(1+\sin x)}$$

$$= \frac{\cos^2 x}{(1+\sin x)\cos x}$$

$$\frac{\cos x}{1+\sin x} = \cos x / 1+\sin x$$

✓

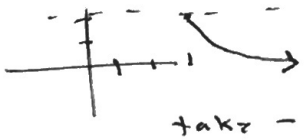
Ob 2.04 Ex 1 $f(x) = (x-2)^2 + 3 \quad x \leq 2$

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

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

$\pm\sqrt{x-3} = y-2$

$y = -\sqrt{x-3} + 2$



take − square root for reflection

Ob 2.04 Ex 4 $y = 2^{3x} + 4$

$x = 2^{3y} + 4$

$x - 4 = 2^{3y}$

$\log_2(x-4) = 3y$

$y = \frac{1}{3}\log_2(x-4)$

$y = \log_2 \sqrt[3]{x-4}$

Ob 2.05 Ex 1 $r = 2 + 2\sin\theta$

4ft

on calc

Graph in polar

Ob 2.05 Ex 5 $\frac{x^2}{25} + \frac{y^2}{16} = 1$

$16x^2 + 25y^2 = 400$

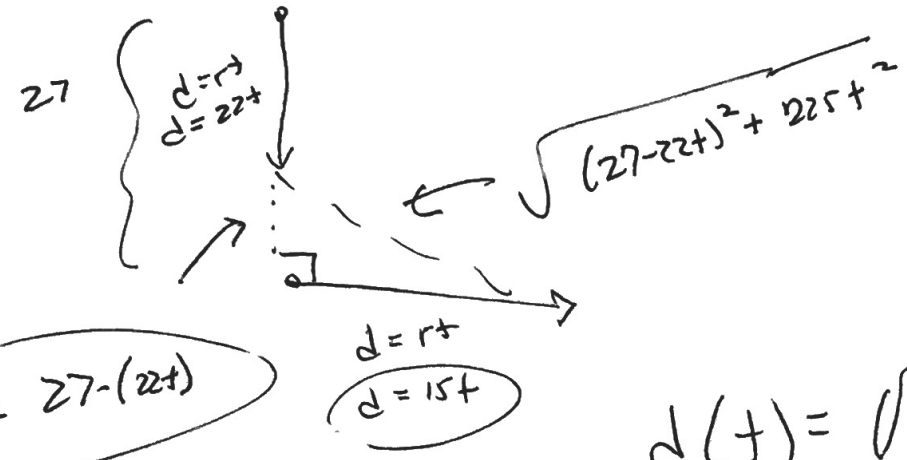
$16(r^2\cos^2\theta) + 25(r^2\sin^2\theta) = 400$

$r^2(16\cos^2\theta + 25\sin^2\theta) = 400$

$r = \sqrt{\frac{400}{16\cos^2\theta + 25\sin^2\theta}}$

$r = \frac{20}{16\cos^2\theta + 25\sin^2\theta}$

2.06 ex 1



$d = 27 - (22t)$

$d = 15t$

$d(t) = \sqrt{(27-22t)^2 + 225t^2}$

$y = \sqrt{(27-22t)^2 + 225t^2}$

Ob 2.07 Ex 3

$a_1 = 7 \quad a_2 = \sqrt[3]{a_1 + 1} \quad a_3 = \sqrt[3]{a_2 + 1}$

$a_{n+1} = \sqrt[3]{a_n + 1} \quad n \geq 1$

1	2	3	4	5
7	2.91	2.42	2.34	2.328

2.33

Ob 2.07 Ex 7

$a_{12} = 63 \quad a_{19} = 7$

$63 + 7d = 7$

$d = -8$

$a_n = 151 - 8(n-1)$

$= -8n + 159$

$a = 151$

$a_{26} = \frac{(151 - 1)}{2} 20$

$= 1500$

Ob 2.07 Ex 9 15 rows

1	2	3
25	27	29

a) $a_n = 25 + (n-1)2 = 2n + 23$

b) $S = 15\left(\frac{25 + 53}{2}\right) = 585$ seats

$\times \$12$

c) $\$7020$

Ob 2.08 Ex 4 $f(x) = \frac{x+1}{(x-2)(x+3)}$

$\lim_{x \to -3} f(x) =$ dne

Ob. 2.08 Ex 5 $f(x) = \frac{1}{x}\sin(x)$ as $x \to$

$= 0$

on calc