1. $(8,-2)$ $(2,7)$

$\frac{y_2-y_1}{x_2-x_1}$ $\frac{7--2}{2-8}$ $\frac{9}{-6}$ $\frac{3}{-2}$ $\boxed{D}$

2. $y=\frac{3}{5}x+7$
thr $P(6,-4)$

a) parallel $y=\frac{3}{5}x+7$ $m=\frac{3}{5}$

$y-y_1=m(x-x_1)$

$\boxed{y--4=\frac{3}{5}(x-6)}$

b) $\perp$

$\perp$ slope $-\frac{5}{3}$

$y-y_1=m(x-x_1)$

$y--4=-\frac{5}{3}(x-6)$

$\boxed{y+4=-\frac{5}{3}(x-6)}$

3) $y = 5 - \sqrt{9 - x^2}$

a) Domain $[-3, 3]$

b) Range $[2, 5]$

c) Even odd neither Even

Range $5 - \sqrt{9 - (-3)^2} = 5$

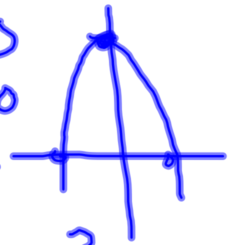
$5 - \sqrt{9 - 0^2} = 2$

$9 - x^2$ must be ≥ 0 otherwise it is imag

$9 - x^2 \geq 0$

$(3 - x)(3 + x) \geq 0$

where is this graph above x-axis?



From -3 to 3

include -3 and 3

4) $f(x) = \begin{cases} -.5x & x < -2 \\ \sqrt{x+2} & x \geq -2 \end{cases}$

a) Graph b) domain c) range

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

x	$\sqrt{x+2}$	
-2	0	closed
-1	1	
2	2	

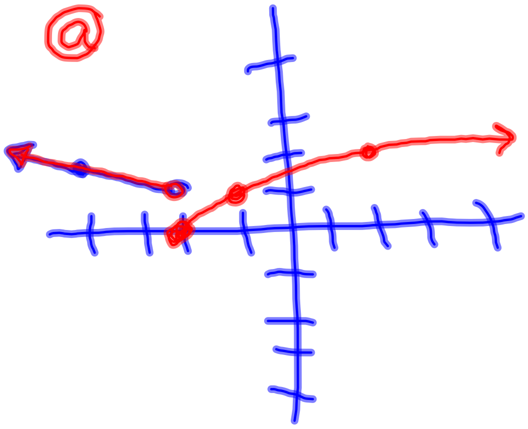
$-.5x$

$y = -\frac{1}{2}x + 0$

x	y
-4	2
-2	1

open

ⓐ



D: b) $(-\infty, \infty)$

R: c) $[0, \infty)$

5) $f(x) = x^2 + 5$
$g(x) = \frac{1}{x}$

$f \circ g = \left(\frac{1}{x}\right)^2 + 5$ $\cancel{\frac{1^2}{x} + 5}$

$g \circ f = \frac{1}{x^2+5}$

6) $y = 2^{-x} - 1$

x can be any number

exponential 2^x
flipped over y-axis
down 1

D: $(-\infty, \infty)$
R $(-1, \infty)$
Xint $(0,0)$
y INT $(0,0)$

$0 = 2^{-x} - 1$ Table find where y=0
$1 = 2^{-x}$
$x = 0$

7) $4 - 3^x = 0$; $x \approx 1.2619$ or 1.262

8) reduced 25% now 7,500 when 4000

$A(t) = A_0(b)^t$

$4000 = 7{,}500(.75)^x$

$\frac{4000}{7500} = .75^x$

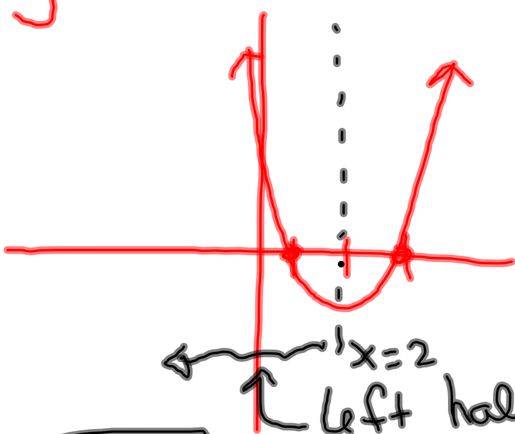
$\ln\left(\frac{4000}{7500}\right) = x \ln .75$

$\frac{\ln\left(\frac{4000}{7500}\right)}{\ln(.75)} = x$

2.185 yrs

9.) $y = x^2 - 4x + 3$

$y = (x-3)(x-1)$



left half of parabola

where is the axis of symmetry

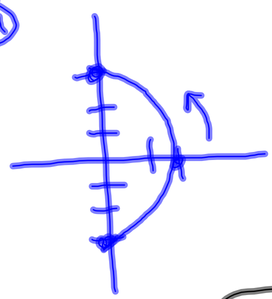
$$\boxed{\begin{aligned} x &= t \\ y &= t^2 - 4t + 3 \\ t &\le 2 \end{aligned}}$$

10)

$0 \leq t \leq \pi$

$x = 2\sin t \qquad y = -3\cos t$

a)



b) $x^2 = 4\sin^2 t$
$y^2 = 9\cos^2 t$

$\frac{x^2}{4} = \sin^2 t \qquad \frac{y^2}{9} = \cos^2 t$

$\frac{x^2}{4} + \frac{y^2}{9} = \sin^2 t + \cos^2 t \qquad \boxed{\frac{x^2}{4} + \frac{y^2}{9} = 1}$

Right half of the ellipse

11) $f(x) = \sqrt[3]{x+2} \qquad g(x) = x^3 - 2$

I $g(x) = f^{-1}(x)$

II $(f \circ g)(x) = 1$

III function f is one-to one

True I is $g(x)$ the inverse

$x = \sqrt[3]{y+2}$

$x^3 = y+2$

$x^3 - 2 = y$

$f^{-1}(x) = x^3 - 2$

False II $f(g(x)) = 1$

$\sqrt[3]{(x^3 - 2) + 2}$

$\sqrt[3]{x^3 \cancel{-2+2}} \Rightarrow \sqrt[3]{x^3} \Rightarrow x$

III True

12) $f(x) = \sqrt{3-x}$

find $f^{-1}(x)$ State restrictions if any

$y = \sqrt{3-x}$

$x = \sqrt{3-y}$ Square both sides

$x^2 = 3 - y$

$x^2 - 3 = -y$

$-x^2 + 3 = y$

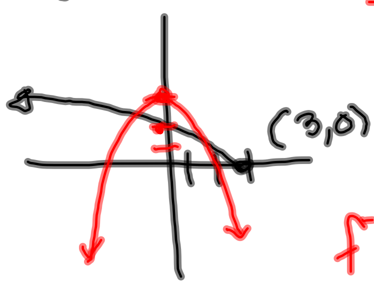
$\boxed{f^{-1}(x) = -x^2 + 3}$

Restriction
$x \geq 0$

square root

graph $\sqrt{3-x}$

3	1
3	0



parabola is not 1 to 1

$f^{-1}(x)$

0	3
1	2

I need right side ⟶

13) 1980 → x = 5

	L_1	L_2
1980	5	7.8
	10	27.8
1985	15	31.6
1990	20	33.9
1995		

a) $y = -20.524 + 19.051 \ln x$

b) 23.973 yrs. from 1975

$$\begin{array}{r} 1975 \\ +\ 24 \\ \hline \approx 1999 \end{array}$$

14) $\frac{3\pi}{8}$

radians $= \frac{3\pi}{8}$ Find arc length
radius $= 4$ ft

$S = \theta r$

$\frac{3\pi}{8}(4) \Rightarrow \boxed{\frac{3\pi}{2} \text{ ft}}$

15) $y = 3\sin(2x - \pi) + 2$

$3\sin\left[2\left(x - \frac{\pi}{2}\right)\right] + 2$

period $\frac{2\pi}{b} = \frac{2\pi}{2}$ $\boxed{\pi}$

Range $[-1, 1]$ mult by $a=3$ $[-3, 3]$ add $d=2$ $\boxed{[-1, 5]}$

D: $(-\infty, \infty)$

16) $\cot x = 4$

$\tan x = \frac{1}{4}$

where is tangent positive (QI, QIII)

QI $\tan^{-1}\left(\frac{1}{4}\right)$ = angle in radians $\boxed{.245}$

QIII $.245 + \pi = \boxed{3.387}$

$\pi = 180°$