1 $-x^2-4$ = Increasing $[-\infty, -4)$
Decreasing $(-4, -\infty]$

= symmetry about the y -axis

= Doman = $(-\infty, \infty)$

= Range = $(-\infty, -4)$

b -4^x+3 = Decreasing $(\infty, -\infty)$

symmetry = No symmetry.

Domain = $(-\infty, \infty)$.

Range = $(-\infty, 3)$

2. a $(f-g)$ = (1,4), (0,-1), (0,-1), (-3,-1).
(2-1, 8-4), (3-3, 5-6), (6-6, 9-10), (7-10, 10-11)

= (1,4), (0,-1), (0,-1), (-3,-1)

b $(f \times g)$ = (2x1, 8x4), (3x3, 5x6), (6x6, 9x10), (7x10, 10x11)

= (2, 32), (9, 30), (36, 90), (70, 110).

NO 14.

$4\cos^2 x + 9\cos x - 9 = 0 \quad 0 \leq x \leq 4\pi$

$\cos(x) = 0, \quad \cos(x) = -9/4$

$\cos(x) = 0, \quad 0 \leq x \leq 720$

$x = 90°, \quad x = 270, \quad x = 450°, \quad x = 630$

$x = 0.5, \quad x = 1.5, \quad x = 2.5, \quad x = 3.5$

$x = 0.5, 1.5, 2.5, 3.5$

NO 15

$A = Pe^{rt}$

$A = 3P = 360$

$3(360) = 1080$

$\frac{1080}{360} = e^{0.13 * 12t}$

~~$3 = e^{1.56t}$~~

$3 = e^{\frac{0.13}{12}t}$

~~$\ln 3 = 1.56t$~~

$\ln 3 = \frac{0.13}{12}t$

~~$1.0986 = 1.56t$~~

~~$t =$~~

$t = 8.5$ years.

18 a) $5^{x-3} = 6^x$

$(x-3)\ln 5 = x \ln(6)$

$x = \frac{3\ln 5}{\ln 5 - \ln 6}$

$= x = -26.48$

b) $5^{2x} - 5^x = 30$

$(5^x)^2 - 5^x = 30$

let $5^x = u$

$u^2 - u = 30$ $\quad u = 6, u = -5$

$5^x = 6$ $\quad x = \frac{\ln 6}{\ln 5}$

$x = 1.1133$

c) $\log_7 x = 3\log_7 9 - \log_7 9$

$\log_7 x = 3\log_7 9 - \log_7(9)$.

$\log_7 x = 2\log_7 9$.

$x = 9^2$

$x = 81$

NO 13

$\cos 2x = \sqrt{6^2 - 5^2}$

opposite $= \sqrt{11}$

$\cos 2x = 1 - 2\left(\frac{\sqrt{11}}{6}\right)^2$

$\cos 2x = \frac{7}{18}$

$\tan 2x = \frac{2\tan x}{1 - \tan^2 x}$

$\tan 2x = \frac{2 \cdot \left(\frac{\sqrt{11}}{5}\right)}{1 - \left(\frac{\sqrt{11}}{5}\right)^2}$

$\tan 2x = \frac{5\sqrt{11}}{7}$

NO 12.

a $s(t) = 34 \sin \frac{\pi t}{11} + 37$.

at 21 s $= \frac{34 \sin \pi (21) + 37}{11} = 47.46$.

32 s $= \frac{34 \sin 32\pi}{11} + 37 = 52.59$.

Avarage change $= \frac{52.59 - 47.46}{32 - 21} = \frac{5.13}{11}$

$= 0.5$

b) $s(t) = 34 \sin \frac{7\pi}{11} + 37$.

$= 34 \sin \left(\frac{7\pi}{11}\right) + 37$

$= 40.537$.

NO 13

$\cos x = 5/6$ $= \sin 2x$

$\cos = \frac{5}{6}$ $\frac{\text{adjacent}}{\text{hypotenese}}$ opposite $\sqrt{6^2 - 5^2}$

$\sin = \frac{\sqrt{11}}{6}$

$\sin 2x = \frac{5\sqrt{11}}{18}$

No 16.

$$D(t) = \frac{600}{1+599(0.7)^t}$$

$$33 = \frac{600}{1+599(0.7)^t}$$

$$33(1+599(0.7)^t = 600$$

$$t = \frac{\log\left(\frac{18999}{6589}\right)}{\log(0.7)}$$

$$t = 10 \text{ weeks}.$$

No 17.

$$(H^+) = 7.4 \times 10^{-6}$$

$$PH = -\log(H^+)$$

$$= -\log(7.4 \times 10^{-6})$$

$$= 5.1$$

$$PH = 5.1$$

The pH is 5.1 which is less than 7 so it is an Acid.

No 18

(d)

$$\log(x-4) + \log(4x+3) = 1$$

$$= (x-4)(4x+3) = 10$$

$$(x-4)(4x+3) = 10$$

$$x = \frac{13+\sqrt{521}}{8}, \quad x = \frac{13-\sqrt{521}}{8}$$

$$x = 4.49$$

3

4 $F(x) = -x^3 + 48x + 2$

$\frac{d\,F(x)}{dx} = -2x^2 + 48$

The point of Minimal or maximun can obtained by

$\frac{d^2 f(x)}{dx^2} = -4x + 0$

$= -4x.$

$+4$ = local minimum

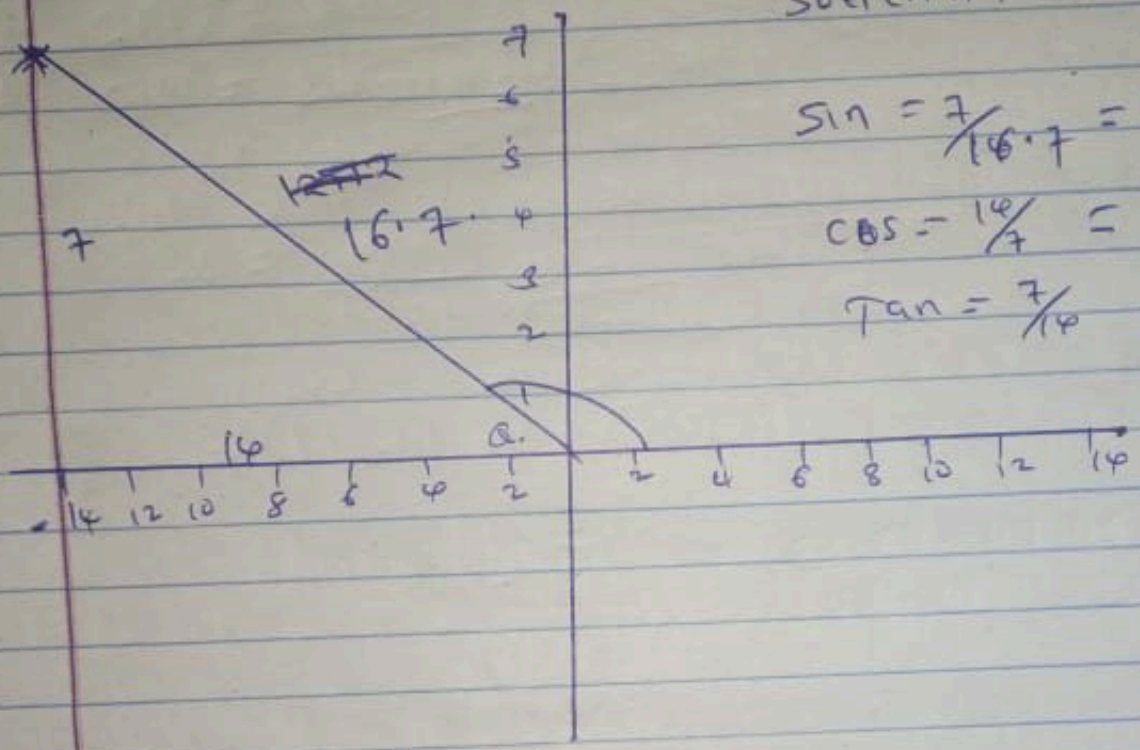
4 = local maximum

$(-4)^3 + 48(4) + 2$

$= 130$

$(4, 130)$

NO 11



SOHCAHTOA

$\sin = \frac{7}{16.7} = 24.8^\circ$

$\cos = \frac{14}{7} =$

$\tan = \frac{7}{14}$