SAMPLE FINAL ANSWERS

① $(x-5)^2+(y+6)^2=81$ CENTER: $\boxed{(5,-6)}$ RADIUS: $\boxed{9}$

② $m_1=\frac{1}{5}$ so $m_2=-\frac{1}{m_1}=-5$ AND $M=(11,6)$ $\boxed{y=-5x+61}$

③ $\boxed{(-\infty,-5]\cup(0,4)\cup(4,6]}$

④ SOLVING $\frac{x^2(x+3)}{(4-x)(4+x)}>0$ GIVES $\boxed{(-\infty,-4)\cup(-3,0)\cup(0,4)}$

⑤ $\boxed{-\sin x}$

⑥ $\sin 75^\circ=\sin 45^\circ\cos 30^\circ+\cos 45^\circ\sin 30^\circ=\frac{\sqrt{2}}{2}\cdot\frac{\sqrt{3}}{2}+\frac{\sqrt{2}}{2}\cdot\frac{1}{2}=\boxed{\frac{\sqrt{6}+\sqrt{2}}{4}}$

⑦ A) $\boxed{31}$ B) $\boxed{10}$ C) $\boxed{\frac{4}{3}}$

⑧ $\frac{f(x+h)-f(x)}{h}=\frac{\sqrt{5(x+h)^2+8}-\sqrt{5x^2+8}}{h}$, WHICH SIMPLIFIES TO $\boxed{\frac{10x+5h}{\sqrt{5(x+h)^2+8}+\sqrt{5x^2+8}}}$

⑨ $\boxed{9\ln x+\frac{1}{2}\ln(x^2+4)-\frac{1}{4}\ln(x-3)-7\ln(5x+1)}$

⑩ $\boxed{x=1 \text{ OR } x=e^2 \text{ OR } x=e^{-2}}$

⑪ MAXIMIZE $A=xy=120x-\frac{2}{5}x^2$ TO GET $\boxed{x=150 \text{ FT}}$ AND $\boxed{y=60 \text{ FT}}$

⑫ $\frac{f(\tau)-f(x)}{\tau-x}=\frac{\frac{1}{2\tau^3+3}-\frac{1}{2x^3+3}}{\tau-x}$, WHICH SIMPLIFIES TO $\boxed{\frac{-2(\tau^2+\tau x+x^2)}{(2\tau^3+3)(2x^3+3)}}$

⑬ MINIMIZE $d^2=(x-5)^2+(y-0)^2=2x^2-12x+47$ TO GET $\boxed{x=3}$ AND $\boxed{y=5}$

⑭ $2\sin^2\theta-\cos\theta-2=0$ GIVES $2(1-\cos^2\theta)-\cos\theta-2=0$,

so $2\cos^2\theta+\cos\theta=0$ OR $(\cos\theta)(2\cos\theta+1)=0$

1) $\cos\theta=0$ GIVES $\boxed{\theta=\frac{\pi}{2}}$ OR $\boxed{\theta=\frac{3\pi}{2}}$

2) $\cos\theta=-\frac{1}{2}$ GIVES $\boxed{\theta=\frac{2\pi}{3}}$ $(\pi-\pi/3)$ OR $\boxed{\theta=\frac{4\pi}{3}}$ $(\pi+\pi/3)$

⑮ A) $\boxed{\frac{7x^2(5x+6)}{2\sqrt{5x+7}}}$ B) $\boxed{\frac{2x(x-12)(x+12)}{(x^2+48)^3}}$

⑯ A) $y=-f(x)-4$

B) $y=f(5-x)$

C) $x=f(y-5)$

SAMPLE FINAL ANSWERS

(17) A) $\cos\theta = \boxed{-\frac{1}{\sqrt{10}}}$ C) $\cos 2\theta = \cos^2\theta - \sin^2\theta = \boxed{-\frac{4}{5}}$

B) $\sin\theta = \boxed{-\frac{3}{\sqrt{10}}}$ D) $\sin 2\theta = 2\sin\theta\cos\theta = \boxed{\frac{3}{5}}$

(18) A) LET $\theta = \sin^{-1}\frac{3}{7}$, SO $\sin\theta = \frac{3}{7}$ AND $\cos 2\theta = 1 - 2\sin^2\theta = \boxed{\frac{31}{49}}$

B) $\boxed{3\sin^{-1}\frac{x}{2} - 5x\sqrt{4-x^2}}$

(19) $A = \frac{1}{2}xy$ WHERE $\frac{y}{x} = \frac{9}{x-5}$, SO $y = \frac{9x}{x-5}$ AND $\boxed{A = \frac{9}{2}\left(\frac{x^2}{x-5}\right)}$

(20) A)
$$x^2 - 3x + 1 \;\overline{)\; x^3 + 5x^2}\;\; \begin{array}{l} x + 8 \\ \\ x^3 - 3x^2 + x \\ \hline 8x^2 - x \\ 8x^2 - 24x + 8 \\ \hline 23x - 8 \end{array}$$

SO $y = x + 8 + \frac{23x - 8}{x^2 - 3x + 1}$ AND

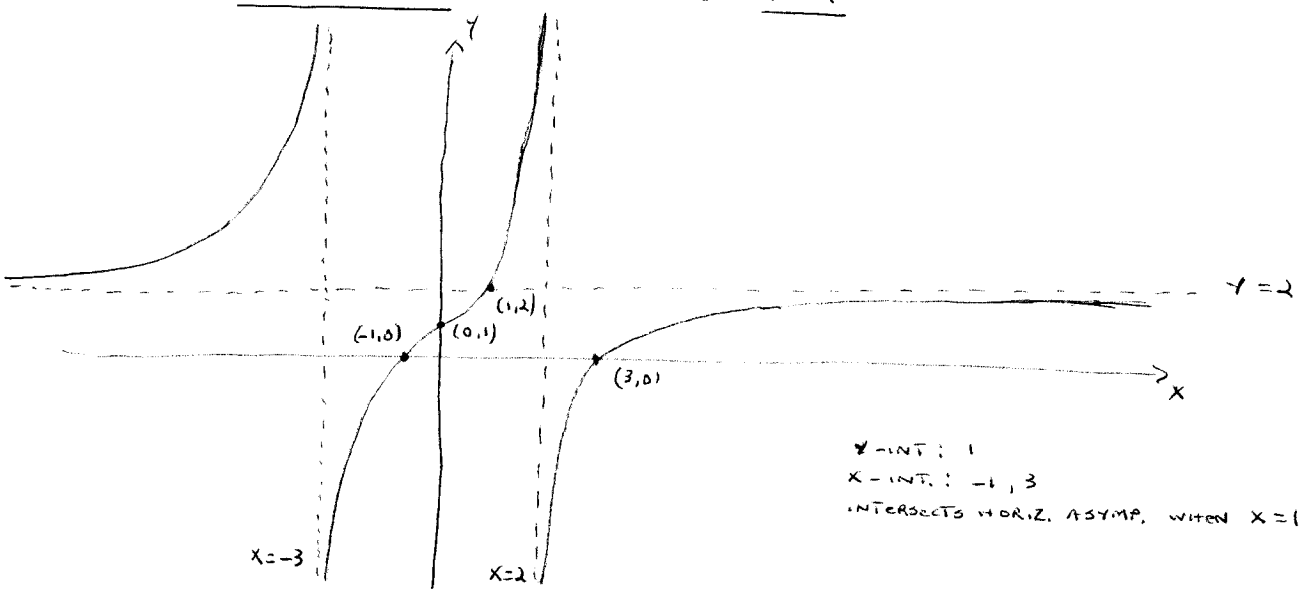
$\boxed{y = x + 8}$ IS THE SLANTED ASYMPTOTE.

B) $y = 5\cos\frac{\pi}{6}x$

(21) $\boxed{\frac{1}{2}(1 + \cos 8\theta) + \frac{1}{2}(1 - \cos 6\theta)}$

(22) MAXIMIZE $A = 2rx = 400r - 2\pi r^2$ TO GET $\boxed{r = \frac{100}{\pi}\text{ M}}$ AND $\boxed{x = 100\text{ M}}$

(23) A) VERTICAL: $x = -3$, $x = 2$ HORIZONTAL: $y = 2$



y-INT: 1
x-INT: -1, 3
INTERSECTS HORIZ. ASYMP. WHEN $x = 1$

(24) $y = Ce^{kt} = 9e^{kt}$ WHEN $t = 11$, $y = 7$; SO $9e^{11k} = 7$ AND $k = \frac{1}{11}\ln\frac{7}{9}$ SO

$y = 9e^{\left(\frac{1}{11}\ln\frac{7}{9}\right)t} = 9\left(\frac{7}{9}\right)^{\frac{t}{11}}$

SOLVING $y = .6(9)$ GIVES $t = \boxed{\frac{11\ln.6}{\ln 7/9}\text{ YRS}}$