$f(x)=3\cos(2x+6\pi)+4$ $\boxed{138}$

AMP = 3 MID = 4

$\cos(2x)=\frac{\pi}{2}\times\frac{1}{2}=\frac{\pi}{4}$ $(0,1)$ $(\frac{\pi}{4},0)$

$3\cos(2x)=(0,3)(\frac{\pi}{4},0)$

$3\cos(2x)+4=(0,7)(\frac{\pi}{4},4)$

$3\cos(2(x+3\pi))+4=$ $(3\pi,7)$ $(\frac{13\pi}{4},4)$ ✓

$\boxed{139}$

$(-1,6)$ MID

$(-3.5,3)$ MIN

AMP $=|6-9|=|3|=3$

$P=-1-(-3.5)=2.5$

~~$P=2.5\times4=10$~~ $\frac{2\pi}{10}=\frac{\pi}{5}$

$\sin(\frac{\pi}{5}x)=\frac{\pi}{2}\times\frac{5}{\pi}=\frac{5\pi}{2\pi}=\frac{5}{2}$

~~$3\sin(\frac{\pi}{5}(x+1))+6$~~

$\sin(\frac{\pi}{5})=(0,0)(\frac{5}{2},1)$

$2.5-1=1.5$

~~$3\sin(\frac{\pi}{5}(x+\frac{3}{2}))+6$~~

~~$3\sin(\frac{\pi}{5}x+\frac{3\pi}{10})+6$~~

~~$P=2.5\times2=5$ $\frac{2\pi}{5}$~~ $\frac{2\pi}{5}$

~~$\sin(\frac{2\pi}{5})=\frac{\pi}{2}\times\frac{5}{2\pi}=\frac{5\pi}{4\pi}=\frac{5}{4}$~~

~~$\sin(\frac{2\pi}{5})=(0,0)(\frac{5}{4},1)$~~

~~$2.5-(-1)=2.25$~~

~~$\sin(\frac{2\pi}{5}(x+\frac{9}{4}))+6$~~

~~$\sin(\frac{2\pi}{5}x+\frac{18\pi}{20})+6$~~

$P=2.5\times4=10$

$B=\frac{2\pi}{10}=\frac{\pi}{5}$

$\sin(\frac{\pi}{5})=\frac{\pi}{2}\times\frac{5}{\pi}=\frac{5\pi}{2\pi}=\frac{5}{2}$

$3\sin(\frac{\pi}{5}(x+1))+6$

$3\sin(\frac{\pi}{5}x+\frac{\pi}{5})+6$ ✓

$200+60+30=290$ $\boxed{140}$

$200+60+30=290=580$

$\frac{1}{2}\times2\frac{1}{2}\times6=37.5$ $\boxed{141}$

$=2400$ ✓ $\boxed{142}$

$(20\cdot20)+(20\cdot20)+(20\cdot20)\times2$

$\boxed{143}$

$\frac{1}{4}$ 3 $(4+3)\times4$

$(4\times4)\times4=64$

$\frac{1}{2}b\times h=\frac{1}{2}4\times3=6\times4=24$

$24+16=40$ ✓

$A>B$ ✓ $\boxed{144}$

$>A<>B$ ✓ $\boxed{145}$

$h(x)=4\sin(\frac{\pi}{4}x+\frac{3\pi}{4})+2$ $\boxed{146}$

$\sin(\frac{\pi}{4}x)=\frac{\pi}{2}\times\frac{4}{\pi}=\frac{4\pi}{2\pi}=2$

$\sin(\frac{\pi}{4}x)=(0,0)(2,1)$

$4\sin(\frac{\pi}{4}x)=(0,0)(2,4)$

$4\sin(\frac{\pi}{4}(x+3))+2$

$4\sin(\frac{\pi}{4}x+\frac{3\pi}{4})+2$

~~$(-3,2)(-5,6)$~~

$(-3,2)(-1,6)$ ✓

$(\pi,-4)$ MID $\boxed{147}$

$(\frac{\pi}{4},-5.5)$ MIN

AMP $=|-4-(-5.5)|=1.5$

$P=\pi-\frac{\pi}{4}=\frac{3\pi}{4}\times4=\frac{12\pi}{4}$

$P=3\pi$ $\frac{2\pi}{3\pi}=\frac{2}{3}$

$\sin(\frac{2}{3}x)=\frac{\pi}{2}\times\frac{3}{2}=\frac{3\pi}{4}$

$\sin(\frac{2}{3}x)=(0,0)(\frac{3\pi}{4},1)$

$1.5\sin(\frac{2}{3}x)=(0,0)(\frac{3\pi}{4},1.5)$

$1.5\sin(\frac{2}{3}x)-4=(0,-4)(\frac{3\pi}{4},-2.5)$

$1.5\sin(\frac{2}{3}(x-\pi))-4$

$1.5\sin(\frac{2}{3}x-\frac{2\pi}{3})-4$ ✓

$f(x)=3\cos(2x+6\pi)+4$ $\boxed{148}$

$\cos(2x)=\frac{\pi}{2}\times\frac{1}{2}=\frac{\pi}{4}$ $(0,1)$ $(\frac{\pi}{4},0)$

$3\cos(2x)+4=(0,7)(\frac{\pi}{4},4)$

$3\cos(2(x+3\pi))+4$ ✓

$(3\pi,7)(\frac{13\pi}{4},4)$

$(\pi,6)$ MAX $\boxed{149}$

$(-\frac{3\pi}{4},2)$ MIN

AMP $=|\frac{6-2}{2}|=\frac{4}{2}$ MID 4

$P=\pi-(-\frac{3\pi}{4})=\frac{7\pi}{4}$

$P=\frac{7\pi}{4}\times2=\frac{14\pi}{4}=3.5\pi$

$B=\frac{2\pi}{3.5\pi}=\frac{4}{7}$

$B=\frac{2\pi}{\frac{14\pi}{4}}=\frac{8\pi}{14\pi}=\frac{8}{14}=\frac{4}{7}$

$\cos(\frac{4}{7}x)=\frac{\pi}{2}\times\frac{7}{4}=\frac{7\pi}{8}$

$\cos(\frac{4}{7}x)=(0,1)(\frac{7\pi}{8},0)$

$2\cos(\frac{4}{7}x)=(0,2)(\frac{7\pi}{8},0)$

$2\cos(\frac{4}{7}(x-\pi))+4$

$(\pi,6)$ $(\frac{15\pi}{8},4)$ ✓

~~$2\cos(\frac{4}{7}x+\frac{4\pi}{7})+4$~~

$2\cos(\frac{4}{7}x-\frac{4}{7}\pi)+4$

$h(x)=3\sin(2x-\pi)+2$ $\boxed{150}$

$\sin(2x)=\frac{\pi}{2}\times\frac{1}{2}=\frac{\pi}{4}$

$\sin(2x)=(0,0)(\frac{\pi}{4},1)$

$3\sin(2x)=(0,0)(\frac{\pi}{4},3)$

$3\sin(2(x-\frac{\pi}{2}))+2$

$(\frac{\pi}{2},2)(\frac{3\pi}{4},5)$

$\frac{\pi}{2}+\frac{\pi}{4}=\frac{2\pi+\pi}{4}=\frac{3\pi}{4}$ ✓

$(1.5,1.5)$ MID $\boxed{151}$

$(1,1)$ MIN

AMP $=1.5-1=\frac{1}{2}$

$P=1.5-1=\frac{1}{2}\times4=\frac{4}{2}=2$

$B=\frac{2\pi}{2}=\pi$

$\sin(\pi x)=\frac{\pi}{2}\times\frac{1}{\pi}=\frac{\pi}{2\pi}=\frac{1}{2}$

$\sin(\pi x)=(0,0)(\frac{1}{2},1)$

$\frac{1}{2}\sin(\pi x)=(0,0)(\frac{1}{2},\frac{1}{2})$

$\frac{1}{2}\sin(\pi(x-\frac{3}{2}))+\frac{3}{2}$

$\frac{1}{2}\sin(\pi x-\frac{3\pi}{2})+\frac{3}{2}$ ✓

$h(x)=2\cos(0.5x-0.25\pi)-5$ $\boxed{152}$

$h(x)=2\cos(\frac{1}{2}x-\frac{\pi}{4})-5$

$\cos(\frac{1}{2}x)=\frac{\pi}{2}\times\frac{2}{1}=\frac{2\pi}{2}=\pi$

$\cos(\frac{1}{2}x)=(0,1)(\pi,0)$

$2\cos(\frac{1}{2}x)=(0,2)(\pi,0)$

$2\cos(\frac{1}{2}(x-\frac{\pi}{2}))-5$ ✓

$(\frac{\pi}{2},-3)(\frac{3\pi}{2},-5)$

$(2\pi,3)$ MAX $\boxed{153}$ ✓

$(-\frac{\pi}{2},-4)$ MIN

AMP $=|\frac{3-(-4)}{2}|=\frac{7}{2}=3.5$

$P=-2\pi-(-\frac{\pi}{2})=\frac{3\pi}{2}\times2$

$P=\frac{6\pi}{2}=3\pi$ MID $=-0.5$

$\cos$ $B=\frac{2\pi}{3\pi}=\frac{2}{3}$ $\frac{\pi}{2}\times\frac{3}{2}=\frac{3\pi}{4}$

~~$\cos(\frac{3\pi}{4})$~~ $\cos(\frac{2}{3}x)=(0,1)(\frac{3\pi}{4},0)$

$3.5\cos(\frac{2}{3}(x+2\pi))-0.5$

$3.5\cos(\frac{2}{3}x+\frac{4\pi}{3})-0.5$

$H(t)$ $\boxed{H/09/13}$ $\boxed{154}$

$H(t)=7-7\cos(\frac{2\pi(t-2)}{20})$

$(\frac{2\pi t}{20}-\frac{4\pi}{20})$

$B=\frac{2\pi}{\frac{2\pi t}{20}}=\frac{40\pi}{2\pi t}=20t$

~~$B=\frac{20t}{4}=5t$~~

$\cos(\frac{2\pi(t-2)}{20})=0$ MID

SINCE

$\cos(\theta)=0$ IF

$\theta=\pm\frac{\pi}{2}+2\pi n$ ✓

$\frac{2\pi(t-2)}{20}=\pm\frac{\pi}{2}+2\pi n$

$t-2=\pm5+20n$ $t\geq0$

$t=-3,7,17,27$

MIN $=0$ Lux, 0 $\boxed{155}$

MAX $=0.25$ Lux, 29.53

~~MID~~

~~$L(t)=0.25\sin(x)$~~

$B=\frac{2\pi}{29.53}=\frac{\pi}{14.765}$

$L(t)=\sin(\frac{\pi}{14.765}x)$ $\frac{\pi}{2}\times\frac{14.765}{\pi}$

$\sin(\frac{\pi}{14.765}x)=\frac{14.765\pi}{2\pi}=7.3825$

$L(t)=0.25\sin(\frac{\pi}{14.765}(x-7))$

~~$L(t)=0.25\sin(\frac{\pi}{14.765}x-\frac{7\pi}{14.765})$~~

AMP $=|\frac{0.25}{2}|=0.125$

$7>0$ $\cos(x)$

$\cos(x)=(0,1)(\frac{\pi}{2},0)$

$\cos(x)=(0,\frac{1}{4})(\frac{\pi}{2},0)$

$\frac{2\pi}{29.53}$ $\frac{1}{4}=0.125$

$\cos(\frac{2\pi}{29.53}(t-7))+0.125$

$0.125\cos(\frac{2\pi}{29.53}t-\frac{14\pi}{29.53})+0.125$

$0.125\cos(\frac{\pi}{14.765}t+\frac{7\pi}{14.765})+0.125$ ✓

$L(t)=\frac{1}{8}(\frac{\pi}{14.765}t+\frac{7\pi}{14.765})+\frac{1}{8}$

~~$P=365$~~ $(0,365)$ DAYS $\boxed{156}$

$(675.85, 779.60$ WAS$)$

$t=365-11=354$

$(354,675.85)$

AMP $=779.60-675.85$

AMP $=\frac{103.75}{2}=51.875$

AMP $=51\frac{33}{40}$

$B=\frac{2\pi}{365}$ $\cos(x)$

$\cos(t+11)$ $(-11,1)$ $(\frac{\pi}{2},0)$

$51\frac{33}{40}\cos(\frac{2\pi}{365}t)$

$\frac{\pi}{2}\times\frac{365}{2\pi}=\frac{365\pi}{4\pi}=\frac{365}{4}=91.25$

$L(t)=51\frac{33}{40}\cos(\frac{2\pi t}{365})+675.85$

$L(t)=51\frac{33}{40}\cos(\frac{2\pi}{365}(t+11))+675.85$

~~$L(t)=51\frac{33}{40}\cos(\frac{2\pi}{365}t+\frac{22\pi}{365})+675.85$~~

~~AMP $=727.714002$~~

MID = AVG $=\frac{779.6+675.85}{2}$

MID $=727.725$

$L(t)=-51\cos(\frac{2\pi}{365}t)+727.725$

THEN:

$L(t)=-(51+\frac{33}{40})\cos(\frac{2\pi}{365}t+\frac{22\pi}{365})+$ MID

$(51+\frac{33}{40})\cos(\frac{2\pi}{365}t+\frac{22\pi}{365})+727.725$

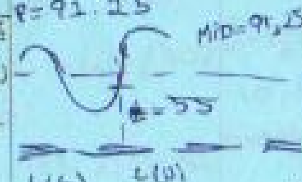
$\cos(t+11)\rightarrow\cos(355+11)$

$L(t)=51.875(\frac{2\pi}{365}t+\frac{22\pi}{365})+727$

$L(355)=51.875(\frac{2\pi}{365}(355+11)$

$\frac{\pi}{2}\times\frac{365}{2\pi}=\frac{365\pi}{4\pi}=91.25$

$P=91.25$



JUNE 21 : $u=0$, $t=171$ $u=t-171$

$L(u)=A\cos(Bu)+C$

MIN = 382.5 MIN MAX = 1096.5 MIN

JUNE 21 = MAX = 1096.5 $(21,1096.5)$

AMP $=\frac{1096.5+382.5}{2}=739.5$

$1096-739.5=357$

AMP $=357\cos(Bu)+739.5$

$P=B\cdot365=2\pi$

$B=\frac{2\pi}{365}$

u	
0	$357\cos(0)+739.5$
365	$357\cos(2\pi)+739.5$

$L(t)=357\cos(\frac{2\pi}{365}(t-171))+739.5$

$L(t)=-51\cos(\frac{2\pi}{365}(t+11))+727.725$

$\boxed{157}$ $\boxed{15/09/2013}$

$H(t)=5-2\sin(\frac{2\pi(t+1)}{7})$

MAX HEIGHT WHEN $t=$

$-2\sin(\frac{2\pi t}{7}+\frac{2\pi}{7})+5$

MID = 5 AMP $=|-2|=2$

MAX = 7 MIN = 3 MID = 5

$B=\frac{2\pi}{\frac{2\pi}{7}}=\frac{14\pi}{2\pi}=7$ $\sin(\frac{2\pi}{7}t)=\frac{\pi}{2}\times\frac{7}{2\pi}$

$\sin(\frac{2\pi}{7}t)=\frac{7\pi}{4\pi}=\frac{7}{4}$ $(0,0)$

1.75 $(\frac{7}{4},1)$

$-2\sin(\frac{2\pi}{7}(t+1))+5=$ $(-1,5)$

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

$-2\sin(\frac{2\pi}{7}(t+1))+5=$ $(1,5)$

~~$(\frac{11}{4},7)$~~ $(\frac{-3}{4},3)$