U6/L3

PP. 383–384 2, 5, 7 (just sketch), 10

2. $f(x) = 4\cos 3x + 6$, 2 cycles starting at $x = 0$

P: $360 \times \frac{1}{3}$ or $120°$

A: 4

Equ^n of axis: $y = 6$

D: $\{x \in R \mid 0 \le x \le 240°\}$

R: $\{y \in R \mid 2 \le y \le 10\}$

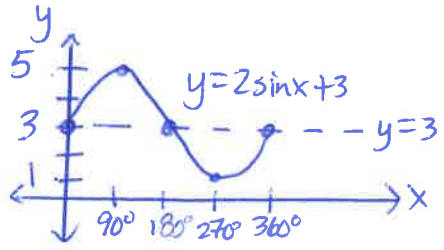
5. What differentiates them is the horiz. comp/exp and P.S.

a) is hor. comp. by a factor of $\frac{1}{2}$ and P.S. is 90° right wh matches (ii)

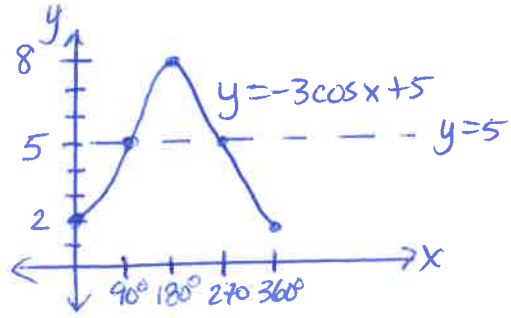
b) is hor. comp. " " " " $\frac{1}{3}$ " " " " " wh matches (iii)

c) is horiz. exp. " " " 2 " " " 30° left " " (i)

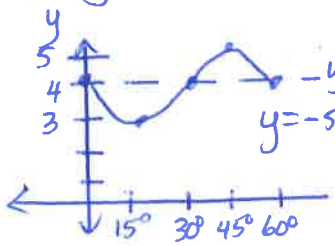
7. a) $y = 2\sin x + 3$



b) $y = -3\cos x + 5$



c) $y = -\sin(6x) + 4$



RW x-values

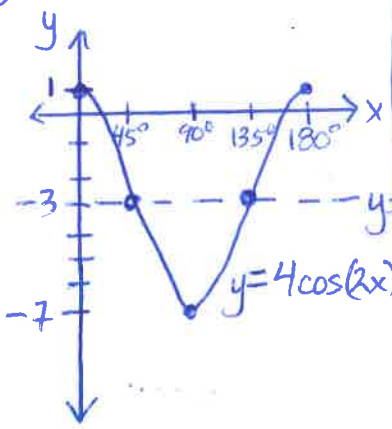
$0 \times \frac{1}{6} = 0°$

$180 \times \frac{1}{6} = 30°$

$360 \times \frac{1}{6} = 60°$

("Roots" (avg y-value))

d) $y = 4\cos(2x) - 3$



RW x-values

$0 \times \frac{1}{2} = 0°$ ← high

$180 \times \frac{1}{2} = 90°$ ← low

$360 \times \frac{1}{2} = 180°$ ← high

p. 384

7. e) $y = \frac{1}{2}\cos(3x - 120°)$ ← Factor!

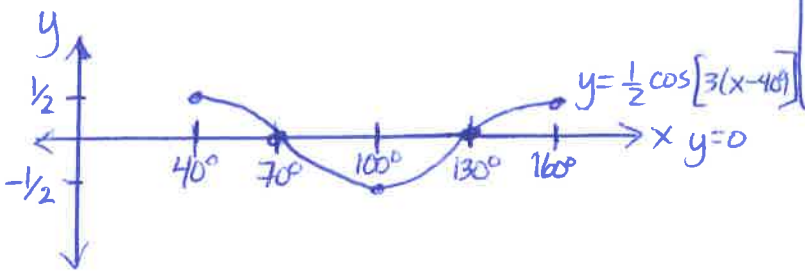
$= \frac{1}{2}\cos[3(x - 40°)]$

RW x-values (for max/min/max)

$0° \times \frac{1}{3} + 40° = 40°$

$180° \times \frac{1}{3} + 40° = 100°$

$360° \times \frac{1}{3} + 40° = 160°$



7. f) $y = -8\sin\left[\frac{1}{2}(x + 50°)\right] - 9$

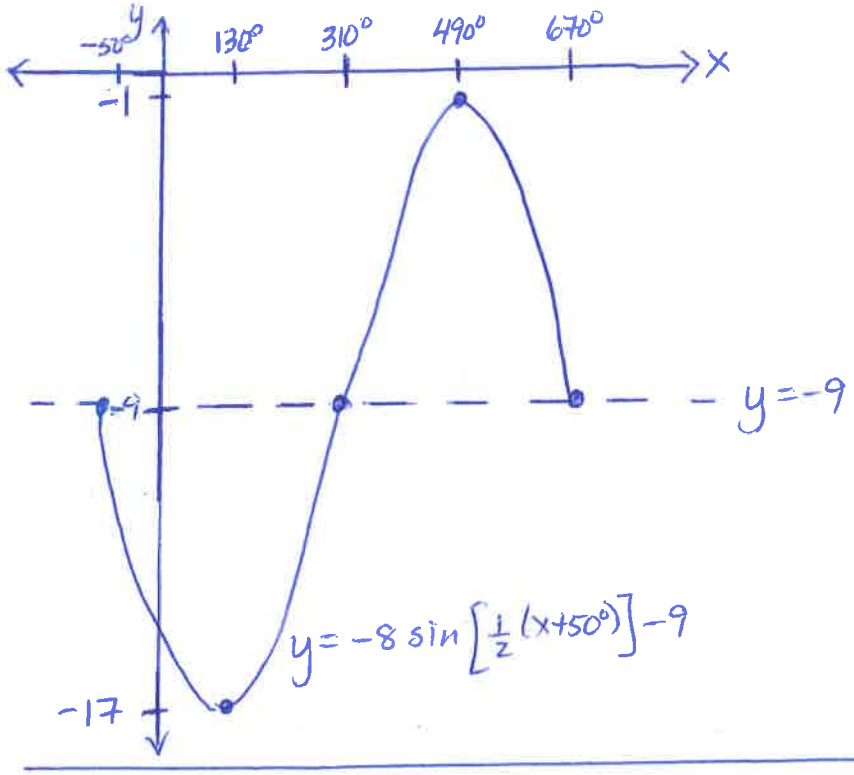
RW x-values (for 'roots')

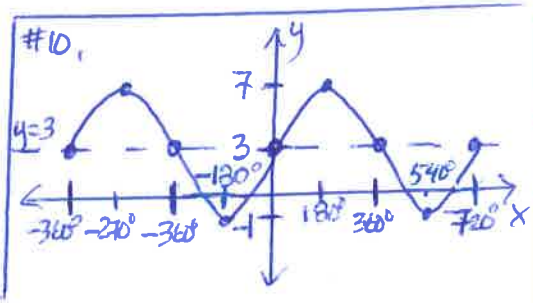
$0° \times 2 - 50° = -50°$

$180° \times 2 - 50° = 310°$

$360° \times 2 - 50° = 670°$

reflected in x-axis





10. a) If $R\{y \in \mathbb{R} \mid -1 \le y \le 7\}$ and $P: 720°$, then $c = \frac{-1+7}{2}$ or 3, $a = 4$, and $k = \frac{360}{720}$ or $\frac{1}{2}$, and the equ^n is $y = 4\sin\left(\frac{1}{2}x\right) + 3$.

b) If the same details apply to a cosine function then the only change is a phase shift of $90°(2)$ or $180°$ right, or $270°(2) = 540°$ to the left or it is a reflected cosine curve with a P.S. of $90°(2) = 180°$ to the left.

Text answer is incorrect.

∴ Possible equ^{ns} are: $y = 4\cos\left[\frac{1}{2}(x - 180°)\right] + 3$, $y = 4\cos\left[\frac{1}{2}(x + 540°)\right] + 3$ or

$y = -4\cos\left[\frac{1}{2}(x + 180°)\right] + 3$