Tutorial 2 P1

Q1

a) 1.2566 rad b) 0.9425 rad c) -1.0472 rad d) -5.2360 rad

Q2

a) 210° b) 114.6° c) 50° d) -24°

Q3

a) $-670°, -310°, 410°, 770°$ b) $-\frac{13\pi}{4}, -\frac{5\pi}{4}, \frac{11\pi}{4}, \frac{19\pi}{4}$ c) $-\frac{13\pi}{6}, -\frac{\pi}{6}, \frac{23\pi}{6}, \frac{25\pi}{6}$

d) $-\frac{17\pi}{4}, -\frac{9\pi}{4}, \frac{7\pi}{4}, \frac{15\pi}{4}$

Q4 $\frac{5\pi}{2}$ m

Q5

a) $\frac{128\pi}{9}$ b) 25

Q6 $\frac{\pi}{4}$ m^2

Q7

a) $\sin\theta = \frac{4}{5}$ $\csc\theta = \frac{5}{4}$
$\cos\theta = \frac{3}{5}$ $\sec\theta = \frac{5}{3}$
$\tan\theta = \frac{4}{3}$ $\cot\theta = \frac{3}{4}$

b) $\sin\theta = \frac{40}{41}$ $\csc\theta = \frac{41}{40}$
$\cos\theta = \frac{9}{41}$ $\sec\theta = \frac{41}{9}$
$\tan\theta = \frac{40}{9}$ $\cot\theta = \frac{9}{40}$

c) $\sin\theta = \frac{7}{8}$ $\csc\theta = \frac{8}{7}$
$\cos\theta = \frac{\sqrt{15}}{8}$ $\sec\theta = \frac{8}{\sqrt{15}}$
$\tan\theta = \frac{7}{\sqrt{15}}$ $\cot\theta = \frac{\sqrt{15}}{7}$

Q8

a) $12\sqrt{2}$ b) $\frac{4}{\sqrt{3}}$ c) $\frac{25}{\sin 53°}$

Q9

a) $\frac{170}{\sqrt{3}}$ b) $\frac{100}{\sqrt{3}\sin 65°}$ c) $\frac{10}{\sqrt{3}}$

Q11

$10\tan\theta\sin\theta$

Q12

$a = \sin\theta$, $b = \tan\theta$, $c = \frac{1}{\cos\theta}$, $d = \cos\theta$

Q13

236,601.5 mi

Q14

a) 81° b) 45° c) 30° d) $\frac{\pi}{4}$ e) $\pi - 2.3$ rad $= 0.8416$ rad

f) 0.4π

Q15

a) $\frac{1}{2}$ b) 2 c) $\frac{1}{\sqrt{3}}$ d) $-\frac{2}{\sqrt{3}}$ e) $\frac{1}{2}$ f) -1

Q16

a) $\frac{-\sqrt{1-\cos^2\theta}}{\cos\theta}$ b) $\sqrt{1-\sin^2\theta}$ c) $-\sqrt{1+\tan^2\theta}$ d) $\frac{1}{\sqrt{1-\sin^2\theta}}$

Q17

a) $\sin\theta = \frac{3}{5}$ $\csc\theta = \frac{5}{3}$
$\cos\theta = -\frac{4}{5}$ $\sec\theta = -\frac{5}{4}$
$\tan\theta = -\frac{3}{4}$ $\cot\theta = -\frac{4}{3}$

b) $\sin\theta = -\frac{3}{4}$ $\csc\theta = -\frac{4}{3}$
$\cos\theta = \frac{4}{5}$ $\sec\theta = \frac{5}{4}$
$\tan\theta = -\frac{3}{4}$ $\cot\theta = -\frac{4}{3}$

c) $\sin\theta = \frac{\sqrt{45}}{7}$ $\csc\theta = \frac{7}{\sqrt{45}}$
$\cos\theta = -\frac{2}{7}$ $\sec\theta = -\frac{7}{2}$
$\tan\theta = \frac{-\sqrt{45}}{2}$ $\cot\theta = \frac{-2}{\sqrt{45}}$

d) $\sin\theta = \frac{1}{2}$ $\csc\theta = 2$
$\cos\theta = \frac{\sqrt{3}}{2}$ $\sec\theta = \frac{2}{\sqrt{3}}$
$\tan\theta = \frac{1}{\sqrt{3}}$ $\cot\theta = \sqrt{3}$

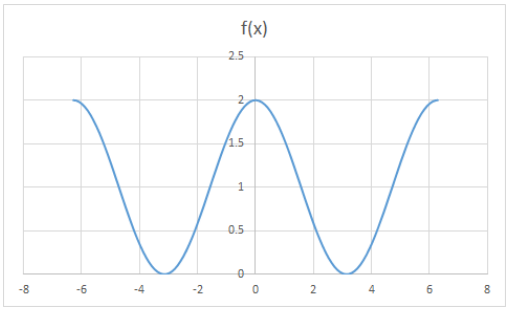
Q18

a) $\sin(2\theta) = \frac{\sqrt{3}}{2}$, $2\sin\theta = \sqrt{3}$ b) $\sin(\frac{1}{2}\theta) = \frac{1}{2}$, $\frac{1}{2}\sin\theta = \frac{\sqrt{3}}{4}$, c) $\sin^2\theta = \frac{3}{4}$ $\sin(\theta^2) = 0.2707$

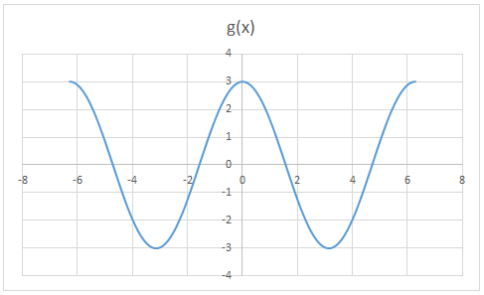
Q19 29.9583

Q20

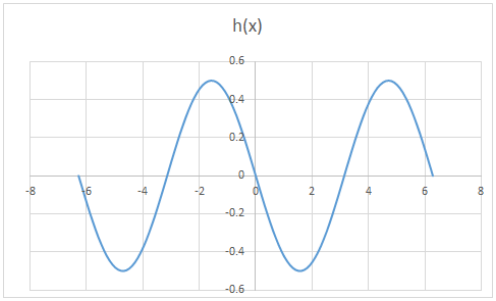
a)



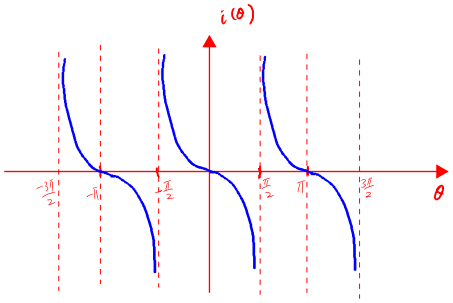
b)



c)



d)



Q21

a) $y = -3\sin x$

amplitude = 3

period = 2π

b) $y = \frac{1}{2}\cos\left(\frac{1}{4}x\right)$

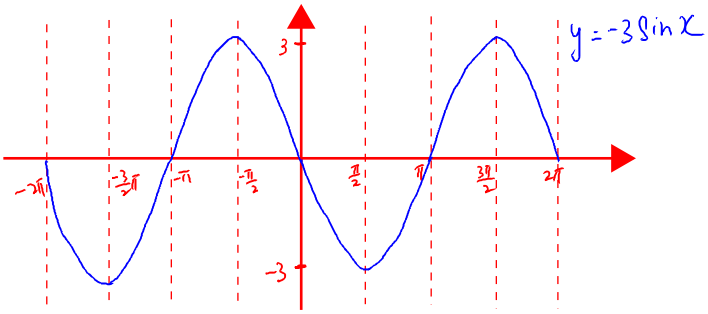
amplitude = $\frac{1}{2}$

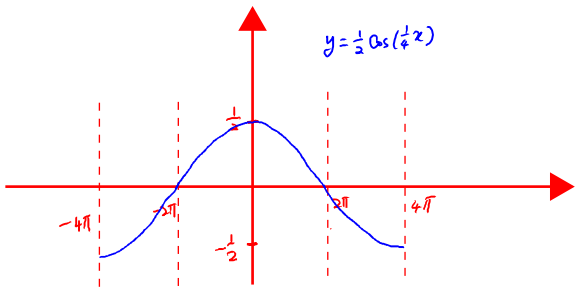
period = 8π

$a\cos bx$

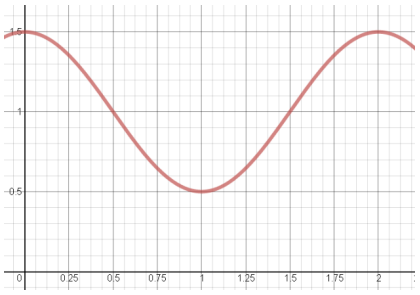
amplitude = $|a|$

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





Q21 c) $y = 1 + \frac{1}{2}\cos \pi x$, amplitude = $\frac{1}{2}$, period = $\frac{2\pi}{\pi} = 2$



$-4\sin\left(2x+\frac{\pi}{2}\right) = -4\sin 2\left(x+\frac{\pi}{4}\right)$

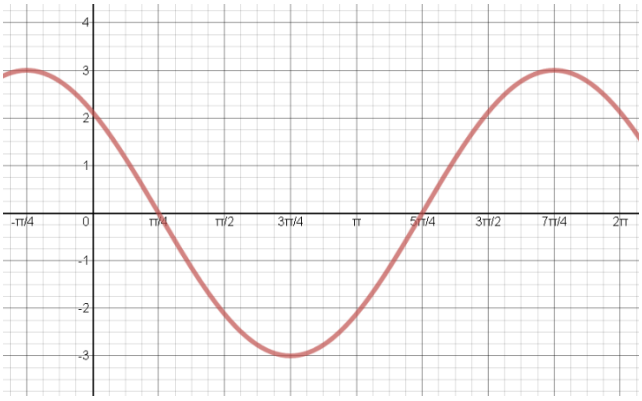
Q22

a) $y = 3\cos\left(x + \frac{\pi}{4}\right)$

amplitude $= 3$

period $= \frac{2\pi}{1} = 2\pi$

phase $= -\frac{\pi}{4}$

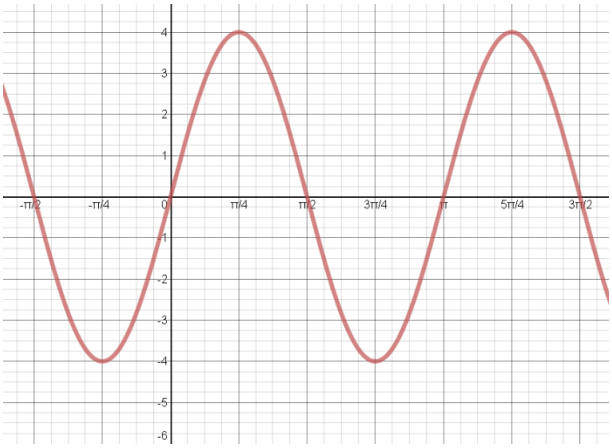


b) $y = -4\sin 2\left(x + \frac{\pi}{2}\right)$

amplitude $= 4$

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

phase $= -\frac{\pi}{2}$



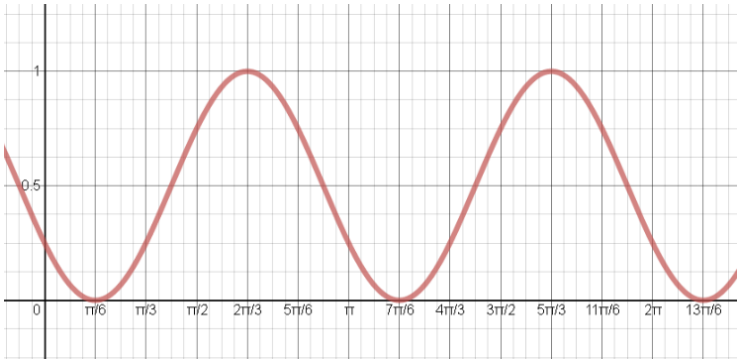
c) $y = \frac{1}{2} - \frac{1}{2}\cos\left(2x - \frac{\pi}{3}\right)$

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

amplitude $= \frac{1}{2}$

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

phase $= \frac{\pi}{6}$



Q23

a) $-\frac{\pi}{2}$ b) $\frac{\pi}{4}$ c) π d) $\frac{\pi}{3}$ e) 0 f) $\frac{\pi}{3}$

g) $\frac{\pi}{6}$ h) $-\frac{\pi}{6}$

Q24

a) $\frac{2}{3}$ b) $\frac{1}{4}$ c) 5 d) $\frac{5\pi}{6}$ e) $-\frac{\pi}{4}$ f) $-\frac{\pi}{3}$

g) 1 h) $\frac{1}{2}$ i) $\frac{-1}{\sqrt{2}}$ j) $\frac{-\pi}{6}$ k) $\frac{\pi}{3}$ l) $-\frac{\pi}{4}$