

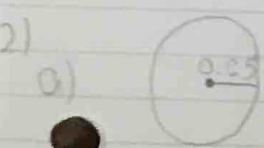
2008:

● Mathematics I 29th April 2008

$$\begin{array}{r} 1) 5x + 2y = 11 \Rightarrow 25x + 10y = 55 \\ 7x + 5y = 11 \quad -14x - 10y = -22 \\ \hline 11x = 33 \\ x = 3 \end{array}$$

if $x = 3, 15 + 2y = 11$
 $2y = -4$
 $y = -2$

$x = 3, y = -2$



● One complete revolution the wheel travelled distance
 $= 2\pi r$
 $= 2\pi(0.65)$
 $= 1.3\pi$

Length = # of revolutions
 circum.

$2 \text{ km} = 2000 \text{ m}$

$2000 = \frac{489.7}{1.3\pi}$

b) $2000 = 1450$
 $2\pi r$
 $1450(2\pi r) = 2000$
 $1450\pi r = 1000$
 $r = 0.22 \text{ m}$

3) a) $U_1 = 3 = \frac{3}{1}$
 $U_2 = 6 = \frac{6}{1} = 5$
 $U_3 = \frac{2(2^2/6) - 1}{2^2/6} = \frac{5/3 - 1}{10/6} = \frac{2/3}{10/6} = \frac{2}{5} = 2$
 $U_4 = \frac{2(2^2/5) - 1}{2(2^2/5)} = \frac{4/5 - 1}{4/5} = \frac{-1/5}{4/5} = -1$
 $U_5 = \frac{2(2^2/4) - 1}{2(2^2/4)} = \frac{-1/2 - 1}{-1/2} = \frac{-3/2}{-1/2} = 3$

a) $3, \frac{5}{6}, \frac{2}{5}, -1, \frac{1}{4}$

b) $3, \frac{5}{6}, \frac{2}{5}, -1, \frac{1}{4}$

repeats every 4
 $27 = 6 \text{ with } 3 \text{ r}$

$27^{\text{th}} \text{ term} = \frac{2}{5}$

sum = 8.216

$6 \left(\frac{3 + \frac{2}{5} - 1}{6 \cdot 5 \cdot 4} \right) + 3 \left(\frac{2}{6 \cdot 5} \right)$

$$4) R = \frac{12\sqrt{L}}{T^2}$$

$$a) L = 8.2, T = 5.7$$

$$R = \frac{12\sqrt{8.2}}{5.7^2} = 1.058$$

$$b) L = 3.8, R = 0.9$$

$$0.9 = \frac{12\sqrt{3.8}}{T^2}$$

$$0.9T^2 = 12\sqrt{3.8}$$

$$T^2 = \frac{12\sqrt{3.8}}{0.9}$$

$$T^2 = 25.99$$

$$T = 5.098$$

$$c) R = 3.4, T = 2.5$$

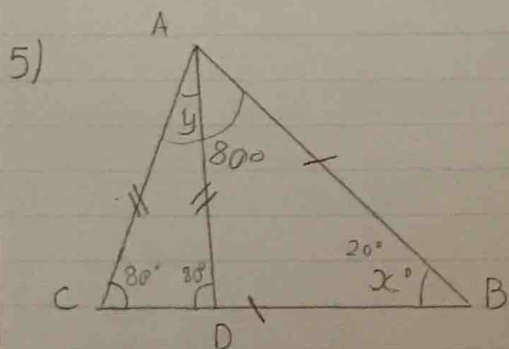
$$3.4 = \frac{12\sqrt{L}}{2.5^2}$$

$$12\sqrt{L} = 21.25$$

$$\sqrt{L} = 1.7708$$

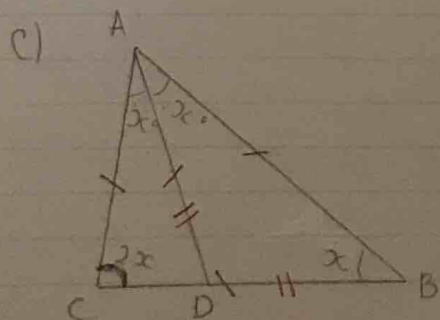
$$L = 1.7708^2$$

$$L = 3.136$$



$$a) y = 180 - 160 = 20^\circ$$

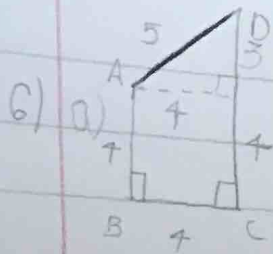
$$b) y = x$$



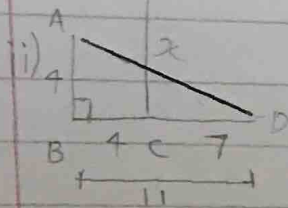
$$2x + 2x + x = 180$$

$$5x = 180$$

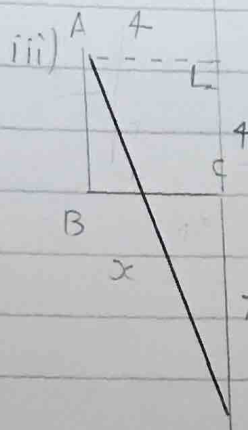
$$x = 36$$



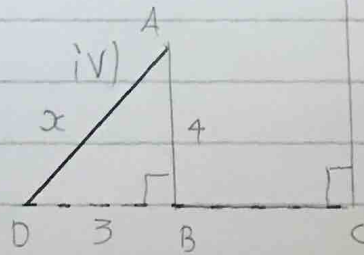
i) $4^2 + 3^2 = x^2$
 $x^2 = 25$ $AD = 5$
 $x = 5$



$4^2 + 11^2 = x^2$
 $x^2 = 137$
 $x = \sqrt{137} = 11.7$



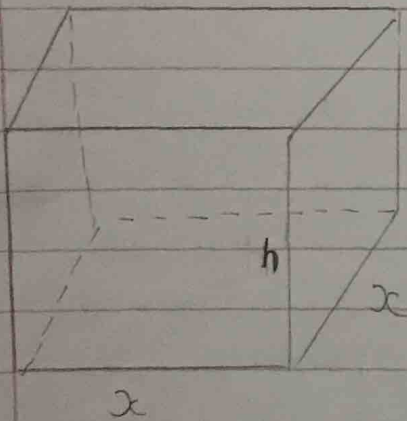
$4^2 + 11^2 = x^2$
 $x^2 = 137$
 $x = \sqrt{137} = 11.7$



$x^2 = 3^2 + 4^2$
 $x^2 = 25$
 $x = 5$

b) It 360° same as 0

7)



- a) $x = 1.5, y = 57.83$
 $x = 2, y = 48$
 $x = 2.5, y = 44.5$
 $x = 3, y = 41.6$
 $x = 3.5, y = 37.357$
 $x = 4, y = 32$
 $x = 4.5, y = 28.28$
 $x = 5, y = 24$

d)

b) x scale 0-5 Steps .5

y scale: 44-66 Steps 1

c) $x = 2.5$

Volume = $x^2 h = 20$

if $x = 2.5$

$\Rightarrow 2.5^2 h = 20$

$\Rightarrow h = 3.2$

8) Area I = $\frac{1}{2} \pi (5)^2 = \frac{25\pi}{2}$

a)

Area II = $5x - \frac{1}{4} \pi (5)^2 = 5x - \frac{25\pi}{4}$

$\frac{25\pi}{2} = 5x - \frac{25\pi}{4}$

$\frac{75\pi}{4} = 5x$

$x = \frac{15\pi}{4}$

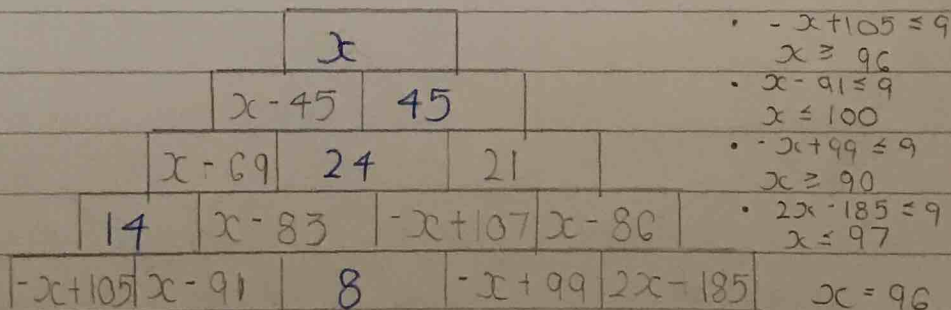
b) AB via P & Q: $x + 5 + (x - 5) = 2x$

AB via R & O: $\frac{1}{4}(10\pi) + 5 + 5 = \frac{5}{2}\pi + 10$

$\Rightarrow 2x = \frac{5}{2}\pi + 10$

$\Rightarrow x = \frac{5}{4}\pi + 5$

9)



- $-x + 105 \leq 9$
- $x \geq 96$
- $x - 91 \leq 9$
- $x \leq 100$
- $-x + 99 \leq 9$
- $x \geq 90$
- $2x - 185 \leq 9$
- $x \leq 97$

To make single digit # x can be

b)	$-x + 105$	$x - 91$	8	$-x + 99$	$2x - 185$
96	9	5	8	3	7
97	8 x	6	8	2	6
98	7	7		1	
99	6	8		0	
100	5 x	9			
101	4 x				
102	3 x				
103	2 x				
104	1 x				
105	0 x				

* 5, 6, 7, 8, 9 give same #

Ans. = 96