(a)

Red counters	7	8	9	10
1	(1, 7)	(1, 8)	(1, 9)	(1, 10)
2	(2, 7)	**(2, 8)**	(2, 9)	(2, 10)
3	(3, 7)	(3, 8)	(3, 9)	(3, 10)
4	(4, 7)	(4, 8)	(4, 9)	(4, 10)

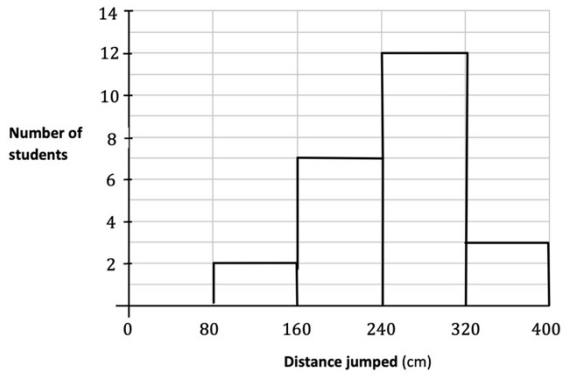
(b) $\frac{4}{16}$

$= \frac{1}{4}$

(c) (2,7) and (3,7)

(a) $2 + 7 = 9$

(b)



(c) $7 + 12 + 3 = 22$

(d) $\frac{0(40)+2(120)+7(200)+12(280)+3(360)}{0+2+7+12+3}$

$= \frac{0+240+1400+3360+1080}{24}$

$= \frac{6080}{24}$

$= 253.33cm$

$= 253[cm]$

(e) Median $= \left(\frac{24+1}{2}\right) = 12.5$

The student lies in the 240-320 interval, between the 3rd and 4th student. Closer to 240 than 320.

Approx 240 + 20 = 260[cm]

(a) **(i)** $7 + 8 = 15$ hours

$15 \times €19 = [€]285$

(ii) $1.5 \times €19 = €28.5$ per hour

$6 \times €28.5 = €171$

(b) $\frac{20}{100} \times €1900 = €380$

Net Income:

$1900 - (380 - 312.5)$

$= 1900 - 67.5$

$= [€]1832.5$

(c) **(i)** $\frac{3.2}{100} \times 2500 = [€]80$

(ii) $2500 + 80 = 2580$ (end year 1)

Intersest year 2: $\frac{3.2}{100} \times 2580 = 82.56$

$2580 + 82.56 = [€]2662.56$

(a) $1 + 4 = 5$ parts total

Concentrate = $\frac{1}{5}$ of 15 litres

= 3 [litres]

(b) $\frac{10000}{250} = 40$ glasses

$40 \times 0.20 = €8$

$€8 - €5.50 = €2.50$ profit

$\frac{2.50}{5.50} = 45.4\dot{5}$

= 45.5 [% profit]

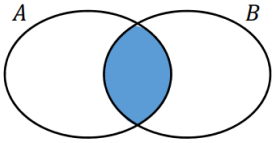
(c) $V = \pi r^2 h$

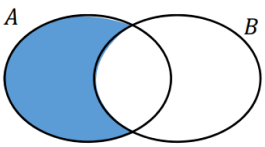
$V = \pi(3)^2(10)$

= 282.7 …

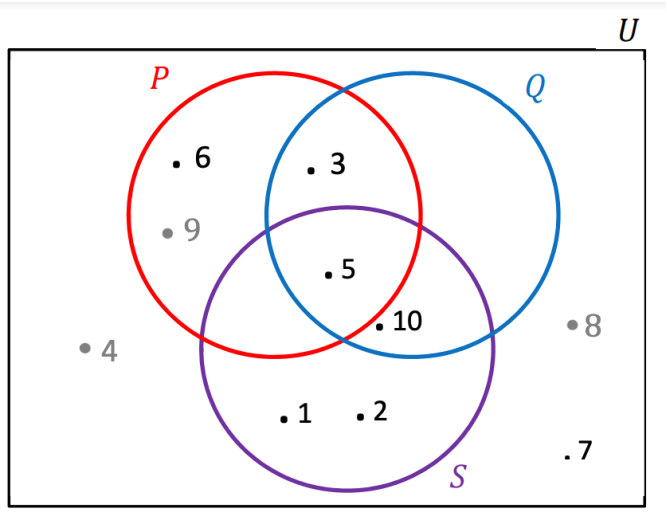
$= 283\ [cm^3]$

(a)

Set	$A \cap B$
Venn diagram	

Set	$A \setminus B$
Venn diagram	

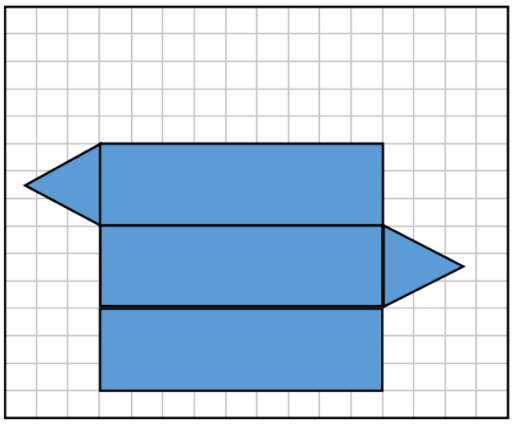
(b)



(i) $P \cap Q \cap S = \{5\}$

(ii) $P \setminus Q = \{6,9\}$

(a)



(a) $x^3 = 216$

$\sqrt[3]{x^3} = \sqrt[3]{216}$

$x = 6[cm]$

(b) **(i)** Surface Area =

$= 2[(5)(y) + (5)(6) + (y)(6)]$

$= 10y + 60 + 12y$

$= 22y + 60[cm^2]$

(ii) $22y + 60 = 269$

$22y = 209$

$y = \frac{209}{22}$

$y = 9.5[cm]$

(c) $lm \times pm \times pl = 96 \times 48 \times 32$

$(lmp)^2 = 147456$

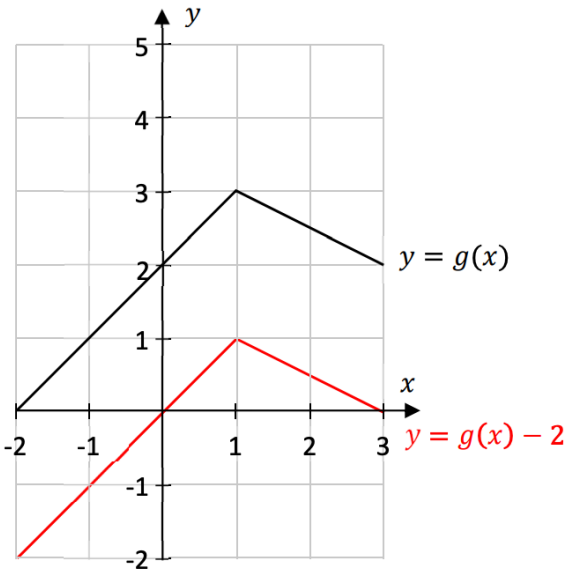
$\sqrt{(lmp)^2} = \sqrt{147456}$

$lmp = 384[cm^3]$

(a) $g(3) = 2$

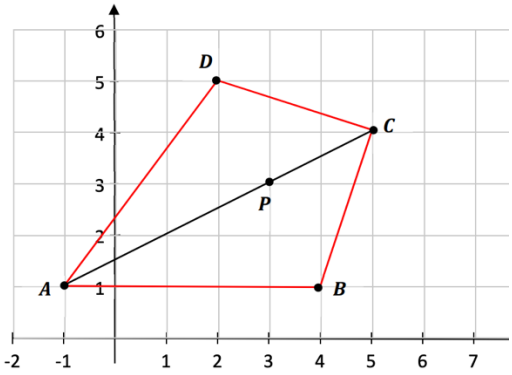
(b) $x = -1$

(c)



(a) $A(-1,1)$ and $C(5,4)$

(b) (i)



(ii) $|AB| = 5$

$|CD| = \sqrt{(5-2)^2 + (4-5)^2}$

$|CD| = \sqrt{(3)^2 + (-1)^2} = \sqrt{10}$

$5 \neq \sqrt{10}$, therefore ABCD is not a parallelogram since opposite sides are not equal in length.

(a) $y = 2x + 5$

Intersects the x axis at $y = 0$

$2x + 5 = 0$

$x = -\frac{5}{2}$

$P\left(-\frac{5}{2}, 0\right)$

(b) $m_k = 2$

$\therefore m_n = -\frac{1}{2}$

$y - y_1 = m(x - x_1)$

$y - 10 = -\frac{1}{2}(x - 0)$

$2y - 20 = -x$

$x + 2y - 20 = 0$

(a) $12 - 3k^2$

$12 - 3(-2)^2$

$12 - 3(4)$

$12 - 12$

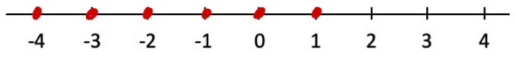
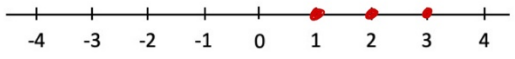
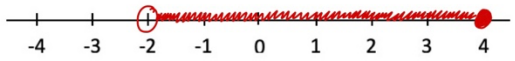
0

(b) $pm + 3p - m - 3$

$p(m + 3) - 1(m + 3)$

$(p - 1)(m + 3)$

(c)

Inequality	Number line
$x < 2$, where $x \in \mathbb{Z}$	
$x \leq 3$, where $x \in \mathbb{N}$	
$-2 < x \leq 4$, where $x \in \mathbb{R}$	

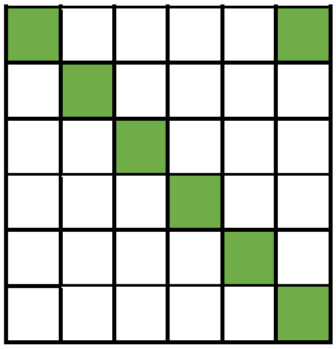
(d) $\frac{5x-2}{3} + \frac{2}{5x+2}$

$$\frac{(5x - 2)(5x + 2) + 2(3)}{(3)(5x + 2)}$$

$$\frac{25x^2 + 10x - 10x - 4 + 6}{(3)(5x + 2)}$$

$$\frac{25x^2 + 2}{(3)(5x + 2)}$$

(a)



(b)

Pattern	Number of coloured squares	Total number of squares
1	4	9
2	5	16
3	6	25
4	7	36
5	8	49
n	$n+3$	$(n+2)^2$

(c) **(i)** $(k+2)^2-(k+3)=271$

$k^2+4k+4-k-3=271$

$k^2+3k+1=271$

(ii) $k^2+3k+1=271$

$k^2+3k-270=0$

$(k-15)(k+18)=0$

$k=15$ and $k\neq -18$

(a) $x^2 = (2.84)^2 + (6.1)^2$

$x^2 = 45.2756$

$x = \sqrt{45.2756}$

$x = 6.73$

(b) $Tan\theta = \frac{o}{a}$

$Tan\theta = \dfrac{3.12}{6.1}$

$\theta = \tan^{-1}\dfrac{3.12}{6.1}$

$\theta = 27.088$

$\theta = 27°$

(c) **(i)** $\frac{x}{3} = \frac{y}{7}$

$x = \dfrac{3y}{7}$

(ii) $\frac{1}{2}(7)(y) - \frac{1}{2}(3)(x) = 6$

$\dfrac{1}{2}(7)(y) - \dfrac{1}{2}(3)\left(\dfrac{3y}{7}\right) = 6\ (\times 14)$

$49y - 9y = 84$

$40y = 84$

$y = \dfrac{84}{40}$

$y = 2.1[m]$