(a)

17.5°C , 18.3°C , 18.49°C etc.

(b)

$17.5°\text{C} \leq \text{t} < 18.5°\text{C}$

(c)

$\text{t} \in \mathbb{R}$. The temperature will take on values that are a decimal throughout the course of the day. i.e. real numbers and continuous.

(a) (i) 300

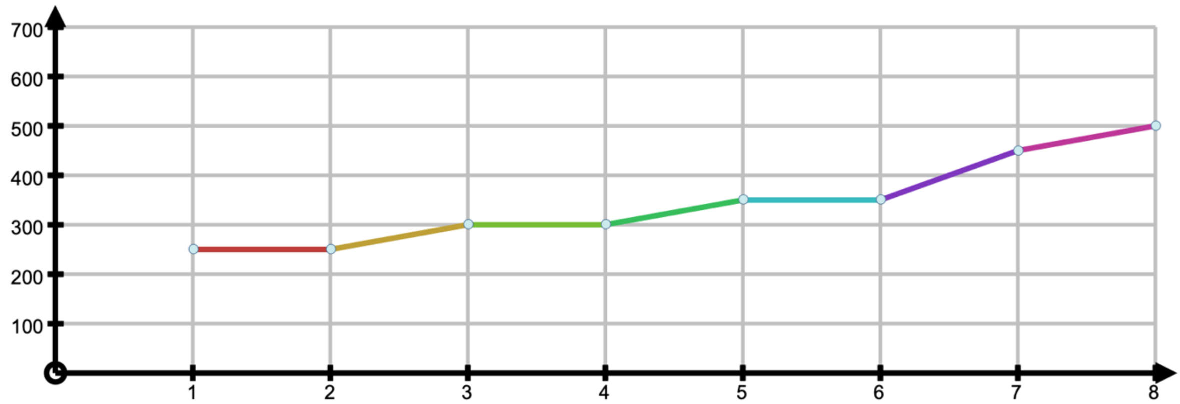
(ii) 50

(b) Month 5

(c) 7 entries into the table, month 6 given.

1	2	3	4	5	6	7	8
250	250	300	300	350	350	450	500

(d)



(e) Month 3 has a greater % increase

Month 3: $\frac{50}{300} \times 100 = 16\frac{2}{3}\%$

Month 5: $\frac{50}{400} \times 100 = 12\frac{1}{2}\%$

(a) $V_{block} = L \times W \times H$

$V = 35 \times 45 \times 16$

$V = 25200 cm^3$

(b) $V_{cylinder} = \pi r^2 h$

$V = \pi r^2 (9)$

$V = 9\pi r^2 cm^3$

(c) $V_{wax\ used} = 25200 \times 90\% = 22680 cm^3$

$V_{wax\ per\ camdle} = 22680 cm^3 \div 100 = 226.8 cm^3$

$9\pi r^2 = 226.8$

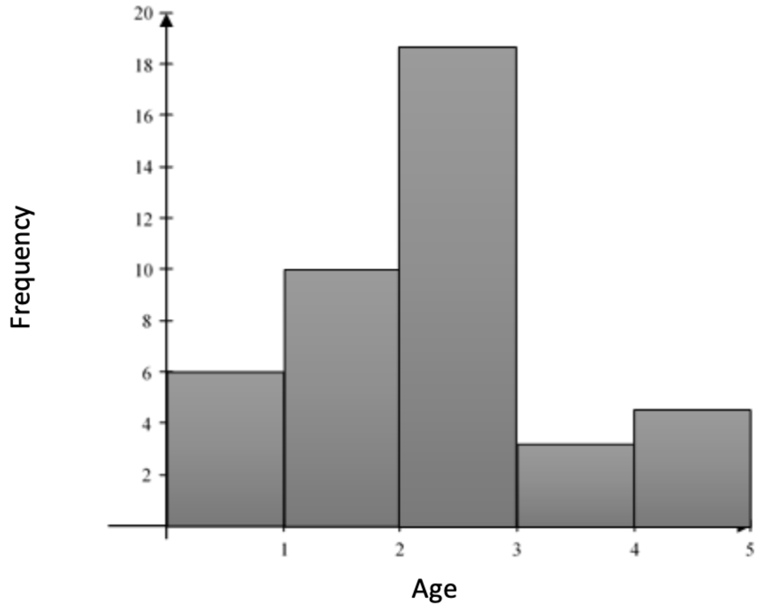
$r^2 = \frac{226.8}{9\pi}$

$r = \sqrt{\frac{226.8}{9\pi}}$

$r = 2.8322$

$r = 2.8$ cm (rounded to 1 d. p.)

(a)



(b) $\% \text{ of children aged } 1 - 2 \text{ years} = \frac{10}{43} \times 100$

$= 23.26$

$= 23\ \%$ (correct to the nearest %)

(c) $\frac{(6\times0.5)+(10\times1.5)+(19\times2.5)+(3\times3.5)+(5\times4.5)}{6+10+19+3+5}$

$= \frac{3+15+47.5+10.5+22.5}{43}$

$= \frac{98.5}{43}$

$= 2.2\dot{9}$

= 2.3 years (correct to 1 decimal place)

(d) 0 – 1 years: 2 staff

1 – 2 years: 2 staff

2 – 3 years: 4 staff

3 – 4 years: 1 staff

Total: 9 staff

(a) 1. even $\times$ even $=$ even

2. odd $\times$ odd $=$ odd

3. odd $\times$ even $=$ even

(b) E E E

E E O

E O E

O E E

E O O

O E O

O O E

O O O

(c) $\frac{7}{8}$

(a) $x + 3$

(b) $x = 8$

Maximum occurs when $8 - x \geq 0$

$8 \geq x$

$x = 8$

(a) (i) Plot the coordinates $C(8,4)$ and $D(3,6)$ on the coordinate plane

(ii) $A(1,1)$ and $B(6,-1)$

(b) (i) $|AB| = \sqrt{(6-1)^2 + (-1-1)^2}$

$= \sqrt{29}$

$|BC| = \sqrt{(8-6)^2 + (4-(-1))^2}$

$= \sqrt{29}$

(ii) $m_{AB} = \frac{-1-1}{6-1} = -\frac{2}{5}$

$m_{BC} = \frac{4+1}{8-6} = \frac{5}{2}$

$m_{AB} \times m_{BC} = -\frac{2}{5} \times \frac{5}{2} = -1$

∴ AB is perpendicular to $(\perp)$ BC

(c) (i) False.

For example:

Not all parallelograms contain right angles

Not all parallelograms have 4 equal sides

A rectangle is not a square

(ii) Every square is a parallelogram

(a) 7.5×1000

$= 7500\text{m}$

(b) $\sin \text{E} = \frac{200}{7500}$

$\text{E} = \sin^{-1} \frac{200}{7500}$

$\text{E} = 1.528°$

$\text{E} = 1.5°$ (to 1 decimal place)

(c) (i) $\frac{1}{3}$

(ii) $\text{Speed} = \frac{\text{distance}}{\text{time}}$

$= \frac{598}{2\frac{1}{3}}$

$= 256.28571$

$= 256.3 \text{ (to 1 decimal place)}$

(d) Label point D at the perpendicular intersection on the line AC.

$|\text{AD}|^2 + 280^2 = 598^2$

$|\text{AD}|^2 = 598^2 - 280^2$

$|\text{AD}|^2 = 279204$

$|\text{AD}| = 528.3976$

$\tan 35° = \frac{280}{|\text{DC}|}$

$|\text{DC}| = \frac{280}{\tan 35°}$

$|\text{DC}| = 399.88144$

$|AC| = |AD| + |DC|$

$|AC| = 528.3976 + 399.8814$

$|AC| = 928.27\text{km}$

$|AC| = 928\text{km (to nearest km)}$

(a) $4x(5x+4)-3(x-2)$

$20x^2+16x-3x+6$

$20x^2+13x+6$

(b) $(3-5y)(3+5y)$

(c) $\frac{5^7\times5^6}{5^{\frac{1}{2}}}$

$=\frac{5^{13}}{5^{\frac{1}{2}}}$

$=5^{\frac{25}{2}}$

(a) USC @ 1.5% $= 12012 \times 0.015$

$= €180.18$

USC @ 3.5% $= 5564 \times 0.035$

$= €194.74$

(b) $0.05x$

(c) $0.07(x - 17576) + 180.18 + 194.74 = 0.05x$

$0.07x - 1230.32 + 374.92 = 0.05x$

$0.07x - 0.05x = 855.40$

$0.02x = 855.40$

$$x = \frac{855.40}{0.02}$$

$x = €42770$

(a) 21000 people remain in the stadium 6 minutes after the end of the match.

(b) $\text{W}(20,0)$

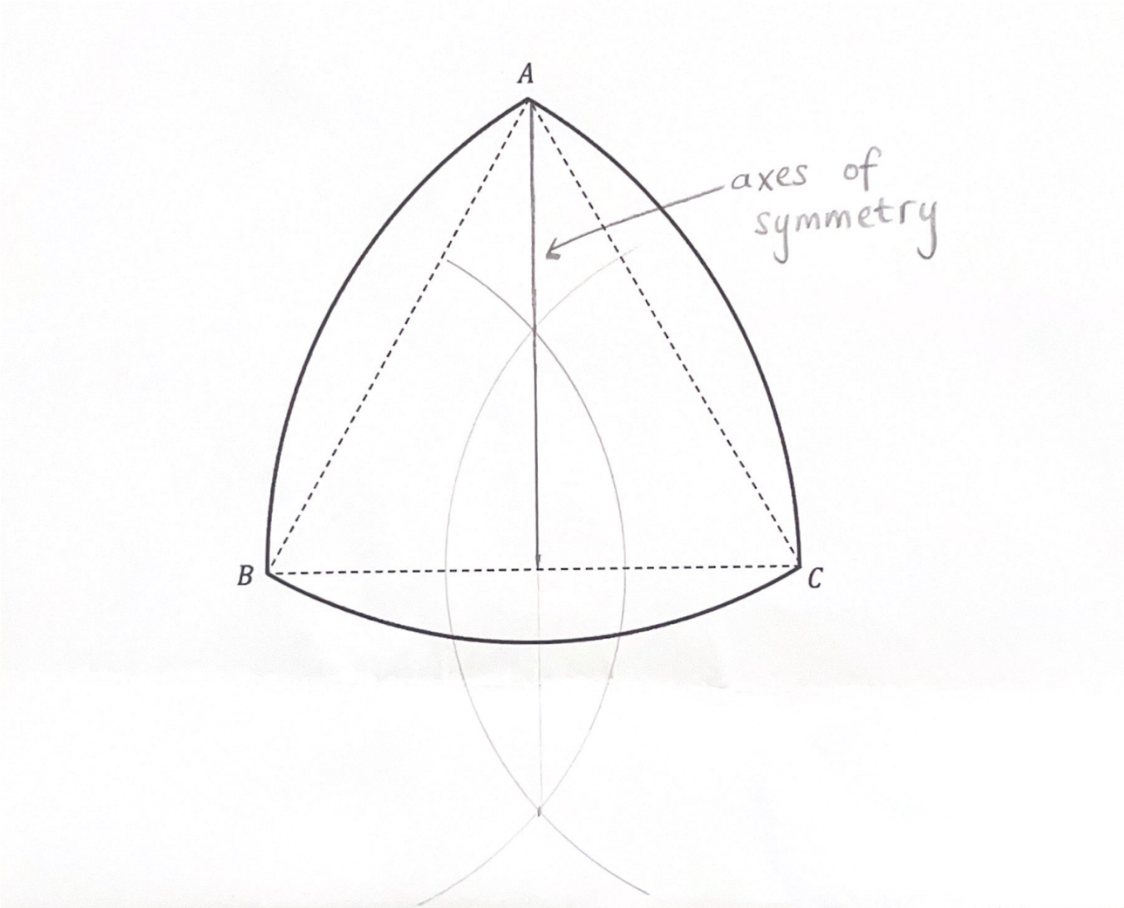
(c) (i) $P = 30000 - 1500(12)$

$= 30000 - 18000$

$= 12000$

(ii) 1500 leave the stadium each minute after the match ends

(a)



(b) (i) $|\angle ACB| = 180° \div 3$

$= 60°$

(ii) Length of circular arc = $\frac{\theta}{360}(2\pi r)$

$\frac{60}{360}(2\pi(40))$

$= 41.8879$

$= 41.89$cm (correct to 2 d.p.)

(a) Height = $x + 0.5\text{m}$

(b) $\text{Area} = \text{length} \times \text{width}$

$x(x + 0.5) = 50\text{m}^2$

$x^2 + 0.5x = 50$

$x^2 + 0.5x - 50 = 0\ (\times 2)$

$2x^2 + x - 100 = 0$

(c) $a = 2, b = 1, c = -100$

$$x = \frac{-1 \pm \sqrt{(1)^2 - 4(2)(-100)}}{2(2)}$$

$$x = \frac{-1 \pm \sqrt{801}}{4}$$

$x = 6.825 \ldots \quad x = -7.325$

$x = 6.83 \ldots \quad x \neq -7.33$

$x = 6.83\text{m}$

(a) $x^2 + 9^2 = 15^2$

$x^2 + 81 = 225$

$x^2 = 144$

$x = \sqrt{144}$

$x = 12$

(b) $\frac{15}{2x} = \frac{9}{y}$

$\frac{15}{24} = \frac{9}{y}$

$15y = 216$

$y = 14.4$