(a) $\$699 + \$30 = \$729$ (find total cost of laptop in \$)

$\$729 \times 0.9$ (multiply by the exchange rate)

$= €656.10$

(b) (i) First $44{,}300$: $44{,}300 \times 0.2 = €8{,}860$

Remainder: $56{,}000 - 44{,}300 = 11{,}700$

Tax on remainder: $11{,}700 \times 0.4 = €4{,}680$

At rate of 20%: $€8{,}860$, At rate of 40%: $€4{,}680$

(ii) Total tax: $€8{,}860 + 4{,}680 - 3{,}300$ (tax credit) $= €10{,}240$

Gross income – total tax = net income

$€56{,}000 - €10{,}240 = €45{,}760$

(a)

WW	WD	**WL**
DW	**DD**	**DL**
LW	**LD**	**LL**

(b) Number of times they win once or more: 5

Total number of times they play: 9

$\frac{5}{9}$

(c) $3^5 = 243$

(d) $mean$: $\frac{sum\ of\ all\ terms}{total\ number\ of\ terms}$

$\frac{3+1+1+0+2+7+1+0+2+1+3}{11} = \frac{21}{11} = 1.909090 = 1.9$

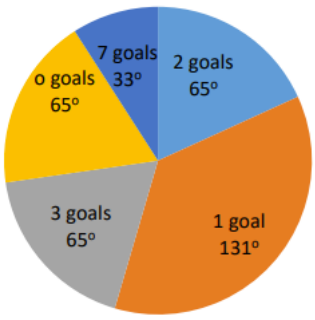
(e) Scored: $0 \rightarrow \frac{2}{11} \times 360 = 65°$

$1 \rightarrow \frac{4}{11} \times 360 = 131°$

$2 \rightarrow \frac{2}{11} \times 360 = 65°$

$3 \rightarrow \frac{2}{11} \times 360 = 65°$

$7 \rightarrow \frac{1}{11} \times 360 = 33°$



(a) $P = (-1\,, 3)$

(b) The line will cross the y-axis when $x = 0$

$(0) + 7y = 20$

$y = \frac{20}{7}$

$\left(0\,, \frac{20}{7}\right)$

(c) The slopes of perpendicular lines when multiplied $= -1$

$m_1 \times m_2 = -1$

Slope of line PQ: $m_1 = -\frac{a}{b}$ ... $ax + by + c = 0$

$m_1 = -\frac{1}{7}$ ... $x + 7y - 20 = 0$

$-\frac{1}{7} \times m_2 = -1$

$m_2 = -1 \div -\frac{1}{7} = 7$

Equation of the line formula: $y - y_1 = m(x - x_1)$

Point: $(6\,, 2)$ $m = 7$

$y - 2 = 7(x - 6)$

$y - 2 = 7x - 42$

$7x - y - 40 = 0$

(d) Find what 1 cm is as an actual distance: $5mm \times 2 = 1cm \rightarrow 100m \times 2 = 200m$

$200m \times 7.1 = 1{,}420m$

$= 1.42km$

(a) The perimeter is the sum of all the lengths of the triangle

$2 + 3.5 + x = 8$

$x = 8 - 2 - 3.5 = 2.5$ cm

(b) (i) $3 + 2x + 2x + 1 = 4x + 4$

(ii) $4x + 4 = 24$

$4x = 20$

$x = 5$ cm

(c) (i) Perimeter of triangle A: 8 cm

Perimeter of triangle B: 24 cm

Common difference: $24 - 8 = 16$ cm (same difference between B and C)

$24 + 16 = 40$ cm

(ii) $5 + y^2 + y^2 + 3 = 40$

$2y^2 = 32$

$y^2 = 16$

$y = 4$ cm

(a) Volume of a cylinder formula: $\pi r^2 h$

Diameter $= 2 \times$ radius

$\pi(3)^2(20)$

$\pi(9)(20)$

180π cm^3

(b) (i) Volume of a sphere: $\frac{4}{3}\pi r^3$

$\frac{4}{3}\pi(15)^3$

$= 4{,}500\pi$ cm^3

(ii) $\frac{total\ volume\ needed}{volume\ per\ pump} \rightarrow \frac{4{,}500\pi}{180\pi}$

$= 25$ seconds

(c) 50 seconds $= 2 \times$ time to pump the balloon (and therefore the volume of Darragh's balloon)

Volume of Gustav's balloon: $4{,}500\pi \times 2 = 9{,}000\pi$

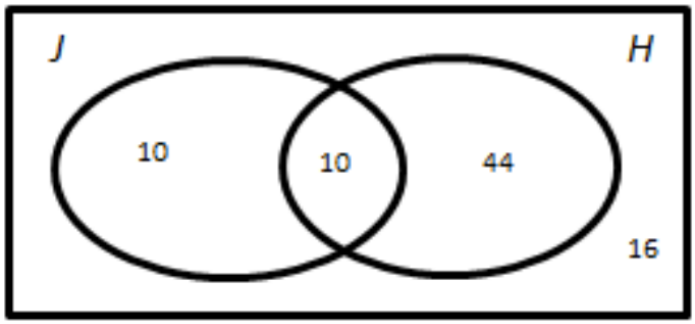
$V = \frac{4}{3}\pi r^3$

$9{,}000\pi = \frac{4}{3}\pi r^3$

$r^3 = 6{,}750$

$r = \sqrt[3]{6{,}750} = 18.89$

$= 18.9$ cm



Neither: $80 \times \frac{1}{5} = 16$

$J \cap H = 0.25\left(\frac{1}{2}\right) \times 80 = 10$

$J/H = 0.25\left(\frac{1}{2}\right) \times 80 = 10$

$H/J = 80 - 10 - 10 - 16 = 44$

$44 + 10 = 54$

(a) (i) $(a^2 \times a^3 = a^{2+3})$ $\quad p = 4\,, q = 4\,, r = 4$

(ii) $p = 3\,, q = 4\,, r = 5$

(b) $b^m \times b^{-2} \times b^{-1} = b^{10}$

$b^{m-2-1} = b^{10}$

$m - 2 - 1 = 10$

$m = 13$

(a) $C = 180 - 90 - 35 = 55°$

(b) Pythagoras theorem: $a^2 + b^2 = c^2$

$220^2 + 154^2 = y^2$

$y^2 = 48{,}400 + 23{,}716 = 72{,}116$

$y = \sqrt{72{,}116} = 268.54$

$= 269$ m

(c) $tan\theta = \frac{opposite}{adjacent}$

$tan20 = \frac{x}{154}$

$154tan20 = x$

$x = 56.05$

Height: $56.05 + 220 = 276.05$

$= 276$ m

(a) $m = 4 + k$

$m = 4 + 7 = 11$

$9(7) - 6(11) = 63 - 66$

-3

(b) Find highest common factor of first 2 terms and then the same for the next 2 terms:

$2x(4a - 7b) + y(4a - 7b)$

$(2x + y)(4a - 7b)$

(c) $\frac{2}{2x+1}\left(\frac{3x+5}{3x+5}\right) - \frac{3}{3x+5}\left(\frac{2x+1}{2x+1}\right)$

$\frac{2(3x+5)}{(2x+1)(3x+5)} - \frac{3(2x+1)}{(3x+5)(2x+1)}$

$\frac{2(3x+5)-3(2x+1)}{(2x+1)(3x+5)}$

$\frac{6x+10-6x-3}{(2x+1)(3x+5)}$

$\frac{7}{(2x+1)(3x+5)}$

(d) $\frac{-b\pm\sqrt{b^2-4ac}}{2a} \rightarrow \frac{-(-7)\pm\sqrt{(-7)^2-4(2)(-3)}}{2(2)}$

$\frac{7\pm\sqrt{49+24}}{4}$

$\frac{7\pm\sqrt{73}}{4}$

$\frac{7+\sqrt{73}}{4} = 3.886 \quad or \quad \frac{7-\sqrt{73}}{4} = -0.386$

$x = 3.89 \; or \; -0.39$

(a) Behind John

(b) Distance: 25 km

Length of time: 1.5 mins

(c) Ali passed John

(d)

	Kayak	Cycle	Run	Total
Jon's time (minutes)	32	38	36	106
Ali's time (minutes)	34	35	36	105

(e) Jon's time to run the race: $\frac{400}{7.8} = 51.282$ seconds

Ali's time: $51.282 + 2 - 53.282$ seconds

Ali's average speed: $\frac{400}{53.282} = 7.5$ m/s

Slope$= \frac{rise}{run}$

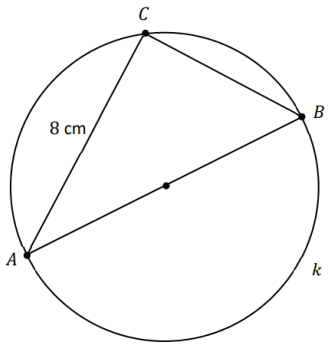
$\frac{rise}{run} = \frac{4}{1}$

$(20 + 1\,, 12 + 4)$

$(21\,, 16)$

(a) Angle ACB $= 90°$ (as the triangle has an angle touching the arc and has a side that is the diameter)

Find the length of the diameter



Area of a circle formula: πr^2

$25\pi = \pi r^2$

$r^2 = 25$

$r = 5$

Diameter $= 2 \times$ radius

Diameter $= 2 \times 5 = 10$

Angle CAB is the smallest: $Cos\theta = \frac{adjacent}{hypotenuse}$

$Cos\theta = \frac{8}{10}$

$\theta = cos^{-1}\left(\frac{8}{10}\right) = 36.87°$