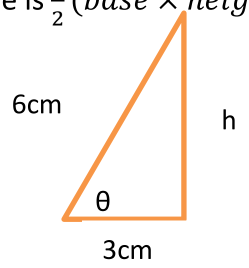
Question	Question	Answer
1 a)	If 1 pound is 1.68 Euros then we multiple $325 \times 1.68 = 546\ Euros$	546
b)	1.50 Euros is 1 pound. There are going to be LESS pounds so we divide 117 by 1.5 = $\frac{117}{1.5} = £78$.	£78
2. a)	The enlargement must have a bottom twice as long so six squares. The height is twice as high so is six tall. The overall shape remains the same. The orientation is not relevant to this question.	
b)	This is a reflection in the y-axis or the line x=0.	
3	Put in $n = 1$ $1^2 + 1 = 2$ Put in $n = 2$ $2^2 + 1 = 5$ Put in $n = 3$ $3^2 + 1 = 10$	2, 5, 10
4 a)	Carefully plot height and length plots.	
b)	They are proportional (positive correlation) so if the sheep is taller it will also be longer.	
c)	Draw a best fit line through these points. Then read where the height is 76cm which is about 108cm Long.	105-110cm
5	Work out the price of one calculator by doing $$\frac{143.64}{19} = £7.56$$ Therefore 31 of these is $31 \times £7.56 = £234.36$	£234.36
6 a)	$F = 1.8C + 32$ When C=-8 then $F = 1.8 \times -8 + 32 = 17.6$	17.6
b)	$F = 1.8C + 32$ When F=68 then $68 = 1.8C + 32$ $68 - 32 = 1.8C$ $36 = 1.8C$ $C = \frac{36}{1.8} = 20$	20

7	A bearing is the angle clockwise from due north. So use your protractor to measure an angle of 60 clockwise of P and draw a line. A bearing of 310 degrees is 360-310 anticlockwise. Measure this and draw a line in this direction. Where these two lines meet is R.	
8 a)	18 toffees 12 mints. The ratio 18:12 which is 3:2	**3 : 2**
b)	The ratio of oranges to apples is 1:5. So for every orange there are 5 apples. If we divide 54 by 6 then that will be the number of oranges = 9. The number of apples is therefore $5 \times 9 = 45$.	**45**
9	$x^3 + 20x = 71$ First put in 2 and then 3 and see which is closest $2^3 + 20(2) = 48$ $3^3 + 20(3) = 87$ So 3 is a little closer so try 2.5 $2.5^3 + 20(2.5) = 65.625$ So it is clearly between 2.5 and 3 but near to 2.5 so try Try 2.7 $2.7^3 + 20(2.7) = 73.683$ This is slightly over so try 2.65 $2.65^3 + 20(2.65) = 71.609$ which is close but still rounds to 72. Try 2.6. $2.6^3 + 20(2.6) = 69.576$. The solution lies between these two but is slightly closer to 2.65 so try 2.64. $2.64^3 + 20(2.64) = 71.199$ But we are only asked for 1.d.p so we know this is **2.6**	**2.6**
10	Set the compass at about half way along a line and draw a curve on both lines. Where these curves cross each line reset the compass to this and redraw a curve between the two lines. Where these two curves cross is the bisector. Draw a line from the origin to the point where the curves cross.	
11	He is wrong because 2 is a prime number and therefore if you add two to most prime numbers you get an ODD number. For example $3 + 2 = 5$ or $7 + 2 = 9$.	
12	Time | Frequency | Average Time | Average	**13 mins**

	$0 < t \leq 6$ | 15 | 3 | 15x3=45 $6 < t \leq 12$ | 25 | 9 | 225 $12 < t \leq 18$ | 20 | 15 | 300 $18 < t \leq 24$ | 12 | 21 | 252 $24 < t \leq 30$ | 8 | 27 | 216 TOTAL | **80** | | **1038** The mean is the total of all the averages divided by the frequency $= \frac{1038}{80} = 12.975 = 13mins\ to\ (2.s.f)$	
13	The perimeter $8\ +\ \pi r$. The radius is half the diameter = 4cm. Therefore perimeter $= 8\ +\ 4\pi = 20.566 = 20.57\ (2.d.p)$	**20.57 (2.d.p)**
14 a)	$a \times a \times a = a^3$	$\boldsymbol{a^3}$
b)	$5(3x-2) = 15x - 10$	$\boldsymbol{15x-10}$
c)	$3y(y+4) = 3y^2 + 12y$	$\boldsymbol{3y^2+12y}$
d)	$2(x-4) + 3(x+2) = 2x - 8 + 3x + 6 = 5x - 2$	$\boldsymbol{5x-2}$
e)	$(x+4)(x-3) = x^2 + 4x - 3x - 12 = x^2 + x - 12$	$\boldsymbol{x^2+x-12}$
15	2.26541555	**2.26541555**
16 a)	$t^6 \times t^2 = t^{6+2} = t^8$ When multiplying powers you add the powers.	$\boldsymbol{t^8}$
b)	$\frac{m^8}{m^3} = m^5$ When dividing powers you subtract them.	$\boldsymbol{m^5}$
c)	$(2x)^3 = 2^3x^3 = 8x^3$	$\boldsymbol{8x^3}$
d)	$3a^2h \times 4a^5h^4 = 12a^{2+5}h^{1+4} = 12a^7h^5$	$\boldsymbol{12a^7h^5}$
17	Use Pythagoras Theorem but be careful as you are asked for one of the shorter lengths! $h^2 = a^2 + b^2$ $9^2 = 6^2 + AB^2$ $AB^2 = 9^2 - 6^2 = 81 - 36 = 45$ $AB = \sqrt{45} = 6.71\ (3.s.f)$	$\boldsymbol{6.71\ (3.s.f)}$

18 a)	The edges of the box represent the quartiles this means that the right hand edge is the upper quartile. This means 75% of the data is below this line but 25% of the data is still above this line. The line through the middle represents the Range and so the heaviest bag is 29kg.	
b)	The median weight is given by the middle line so is 17.	**17**
c)	The interquartile range is the right hand line (upper quartile) minus the left hand line (lower quartile) which is $23 - 10 = 13.$	**13**
d)	10 kg represents the lower quartile of 25% of the data. Therefore the number of bags would be 25% of 240 $\frac{25}{100} \times 240 = 60$	**60**
19 a)	After one year he will have 104% of £4500 = $\frac{104}{100} \times 4500 = 4680$ After two years he will have 104% of £4680 $\frac{104}{100} \times 4680 = £4867.20$	**£4867.20**
b)	Compound interest is worked out at 107.5 so keep multiplying by 1.075 until we reach 3445.51. $2400 \times 1.075 = 2580$ $2580 \times 1.075 = 2773.50$ $2773.50 \times 1.075 = 2981.51$ $2981.51 \times 1.075 = 3205.13$ $3205.13 \times 1.075 = 3445.51$ So it takes five years to get to £3445.51	**5**
20 a)	Using SOHCAHTOA. From the diagram we can see that we have the adjacent (A) and the hypotenuse (H) so this is cos. $\cos x = \frac{5}{8}$ $x = cos^{-1}\frac{5}{8} = 51.3°$	**$51.3°$**
b)	Using SOHCAHTOA. From this diagram we can see we have the opposite (O) and the adjacent (A) so this is Tan.	**10.5**

	$$tan40 = \frac{y}{12.5}$$ $$y = 12.5tan40 = 10.5$$	
21 a)	Need to work out what 50 as a fraction of 258 and then multiple this by 26. $\frac{50}{258} \times 26 = 5$	**5**
b)	The number of female students 50 as a fraction of 258 multiplied by 25+48+62 = $\frac{50}{258} \times 135 = 26.1 = 26$	**26**
22	Expand out $(3n+1)^2 - (3n-1)^2$ $= (3n+1)(3n+1) - (3n-1)(3n-1) =$ $9n^2 + 3n + 3n + 1 - (9n^2 - 3n - 3n + 1) = 6n + 6n =$ $12n$ which 3 x 4n so is always a multiple of 4.	
23 a)	$AB\ = \boldsymbol{b} - \boldsymbol{a}$	$AB\ = \boldsymbol{b} - \boldsymbol{a}$
b)	AP is therefore $\frac{3}{5}(\boldsymbol{b} - \boldsymbol{a})$ $OP = OA + AP = \boldsymbol{a} + \frac{3}{5}(\boldsymbol{b} - \boldsymbol{a}) = \frac{2}{5}\boldsymbol{a} + \frac{3}{5}\boldsymbol{b} = \frac{1}{5}(\boldsymbol{a} + \boldsymbol{b})$	
24	The area of the shaded is the area of the triangle minus the area of the sector. Area of a triangle is $\frac{1}{2}(base \times height) = \frac{1}{2}(6 \times h)$  Where θ=60 as it is an equilateral triangle. Therefore we can find h using SOHCAHTOA. $$\sin 60 = \frac{h}{6}$$ $$h = 6\,sin60 = 3\sqrt{3}$$ Area of each triangle is $=\frac{1}{2}(6 \times 3\sqrt{3}) = 9\sqrt{3}$ Area of a sector $= \frac{1}{2}r^2\theta\ (in\ radians) = \frac{1}{2} \times 3^2 \times \frac{\pi}{3} = \frac{3}{2}\pi$ Area of shaded is therefore $9\sqrt{3} - \frac{3}{2}\pi = 15.59 - 4.71 =$	**10.9 (1.d.p)**

	$10.9\ (1.d.p)$	
25	$\frac{x^2-8x+15}{2x^2-7x-15} = \frac{(x-3)(x-5)}{(2x+3)(x-5)} = \frac{x-3}{2x+3}$	
26	First work out the probability of picking two of the same colour. For orange there is a $\frac{5}{20}$ chance of picking the first one, then there are only 19 left of which only 4 are orange so the there is a $\frac{4}{19}$. Therefore the chance of picking two oranges is $\frac{5}{20} \times \frac{4}{19} = \frac{1}{19}$ Similarly the chance of picking two reds is $\frac{7}{20} \times \frac{6}{19} = \frac{21}{190}$ The chance of picking two yellows is $\frac{8}{20} \times \frac{7}{19} = \frac{14}{95}$ Therefore the probability of picking two the same is $\frac{1}{19} + \frac{21}{190} + \frac{14}{95} = \frac{59}{190}$ And so the probability of NOT picking to the same is $1 - \frac{59}{190} = \frac{131}{190}$	
	END	