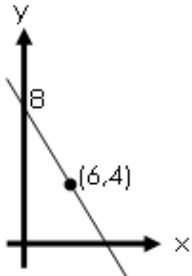
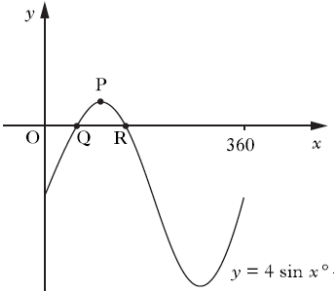


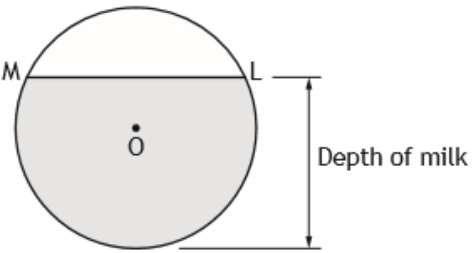
<b>Answers</b>
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		Answers
<b>1</b>	Evaluate  $6\frac{1}{5} - 2\frac{1}{3}$	$3\frac{13}{15}$
<b>2</b>	Find the equation of the line  	$y = -\frac{2}{3}x + 8$
<b>3</b>	Express  $a^2(2a^{-\frac{1}{2}} + a)$  in its simplest form	$2a^{\frac{3}{2}} + a^3$
<b>4</b>	Solve  $x - 2(x - 1) = 8$	$x = -6$
<b>5</b>	Solve  $4\sin x = 2$  for $0^\circ < x < 360^\circ$	$x = 30^\circ, 150^\circ$

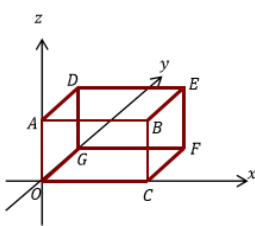
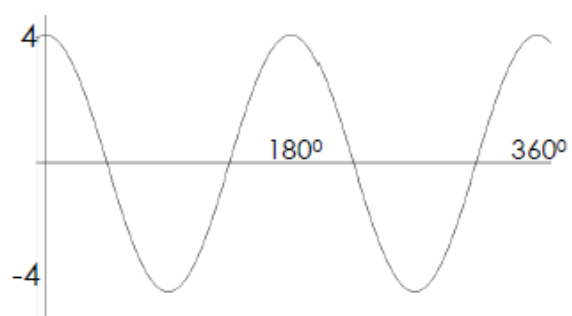
		Answers
<b>6</b>	Find the standard deviation for  $3, 8, 14, 20$  Give your answer to 3 significant figures	s.d. = 7.37 (3 s.f.)
<b>7</b>	Factorise fully  $2x^2 - 32$	$2(x + 4)(x - 4)$
<b>8</b>	A house is bought for £74,000, increases in value 4.5% every year for 3 years.  What is its new value?	New Value = £84,446.29
<b>9</b>	A triangle has sides 83cm, 79cm and 19cm.  Is it right angled?	$83^2 = 6889$ $19^2 + 79^2 = 6602$  Since $83^2 \neq 19^2 + 79^2$ then by the Converse of Pythagoras the triangle is <b>not</b> right-angled.
<b>10</b>	Find the roots of the equation  $y = x^2 - x - 6$	$x = 3, x = -2$

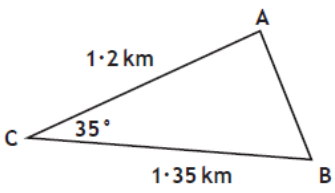
**Answers**

		Answers
11	Evaluate $14.2 + 8.3 \times 40$	346.2
12	Find the equation of the straight line passing through the points $(2, -3)$ and $(2, 9)$	$x = 2$
13	Simplify $\frac{\sqrt{12}}{\sqrt{60}}$	$\frac{1}{\sqrt{5}}$
14	Change the subject of the formula to $b$ . $L = 3a - \sqrt{b}$	$b = (3a - L)^2$
15	The graph shows $y = 5\sin x - 4$ . Find P and Q  $y = 4 \sin x^\circ$	$Q(53.1^\circ, 0)$ $P(90^\circ, 1)$

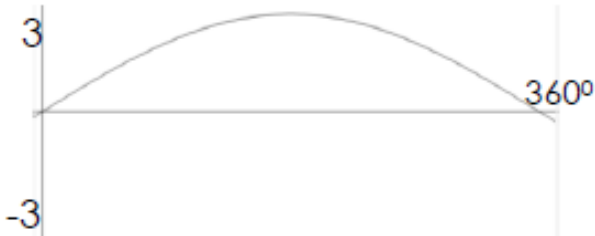
		Answers
<b>16</b>	Solve to one decimal place  $2x^2 + 4x - 9 = 0$	$x = 1.3 \text{ or } x = -3.3 \text{ (1 d.p.)}$
<b>17</b>	Factorise  $2x^2 + 7x - 15$	$(2x - 3)(x + 5)$
<b>18</b>	John paid £297.50 for a laptop in a sale. The discount in the sale was 15%. Calculate the original price.	$\text{Original Price} = \text{£}350$
<b>19</b>	 <p>LM = 1.2m            Radius = 1.8m            Find the depth of milk</p>	$\text{Depth} = 3.497 \text{ m}$
<b>20</b>	Find the roots of the equation  $y = x^2 - 2x - 15$	$x = 5, \quad x = -3$

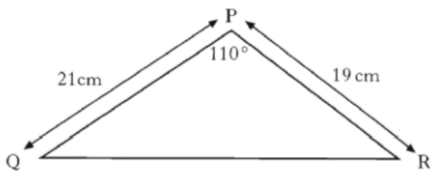
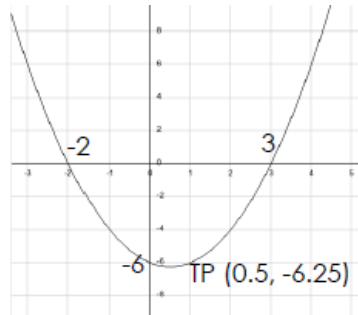
**Answers**

		Answers
21	<p>E has coordinates (5, 3, 1) Find the shortest distance between D and C</p> 	$\sqrt{35}$
22	<p>Find the equation of a straight line through (2, -5) and parallel to <math>y = 3x - 5</math></p>	$y = 3x - 11$
23	<p>Simplify</p> $x^{\frac{1}{2}} \left( x^{\frac{1}{4}} + 3 \right)$	$x^{\frac{3}{4}} + 3x^{\frac{1}{2}}$
24	<p>Solve</p> $x - 3(x - 7) = 9$	$x = 6$
25	<p>Sketch the graph of</p> $y = 4\cos 2x$ <p>for <math>0 \leq x \leq 360</math></p>	

		Answers
<b>26</b>	Find the volume of a sphere with radius 9m, giving your answer to two significant figures	$V = 3100m^3$ (2 s.f.)
<b>27</b>	Remove the brackets and simplify  $(2x + 2)^2 - 2(x^2 - 2)$	$2x^2 + 8x + 8$
<b>28</b>	John paid £20,000 for a motorbike but it depreciated 5.5% each year for 7 years. What was its value after 7 years?	Value = £13,460.24
<b>29</b>	<div style="text-align: center;">  </div> Find length AB	AB = 0.78 km
<b>30</b>	Prove  $\sin^3 x + \sin x \cos^2 x = \sin x$	$\sin x(\sin^2 x + \cos^2 x) = \sin x$  $\sin x(1) = \sin x$  $\sin x = \sin x$

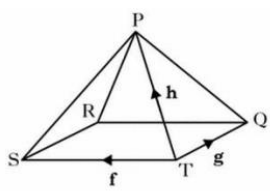
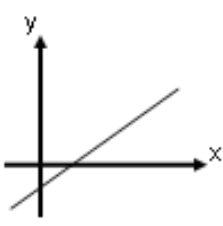
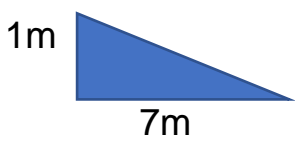
**Answers**


		Answers
<b>31</b>	Evaluate without a calculator:  $\frac{2.1 + 3.2 \times 5}{2^3}$	2.2625
<b>32</b>	Does the point $(-2, 4)$ lie on the line $y = 3x + 10$ ?  Explain your answer.	Point lies on the line since substituting $x = -2$ and $y = 4$ into $y = 3x + 10$ gives: $4 = 3 \times (-2) + 10$ $4 = 4$
<b>33</b>	Simplify  $\sqrt{40} + 4\sqrt{10} + \sqrt{90}$	$9\sqrt{10}$
<b>34</b>	Simplify  $(x - 5)(3x - 2)$	$3x^2 - 17x + 10$
<b>35</b>	Sketch the graph of  $y = 3\sin(0.5x)$  for $0 \leq x \leq 360$	

		Answers
<b>36</b>	<p>Solve</p> $3x^2 + 3x - 7 = 0$ <p>giving your answer correct to 1 decimal place</p>	$x = 1.1 \text{ or } -2.1$
<b>37</b>	<p>Factorise</p> $6x^2 - 24x - 30$	$6(x - 5)(x + 1)$
<b>38</b>	<p>In a sale, a book now cost £36. What was it worth before a 20% discount?</p>	£45
<b>39</b>	<p>Find the area of the triangle</p> 	$\text{Area} = 187.45\text{cm}^2$
<b>40</b>	<p>Sketch</p> $y = (x + 2)(x - 3)$ <p>Label the intercepts and turning point</p>	

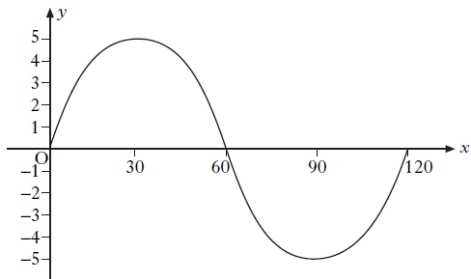


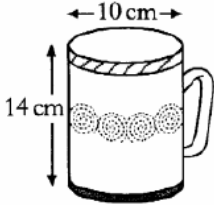
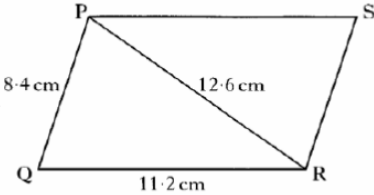
**Answers**

		Answers
<b>41</b>	Express $\overrightarrow{RP}$ in terms of $f, g$ and $h$ 	$\overrightarrow{RP} = -f - g + h$
<b>42</b>	 <p>Chose the correct equation for the above graph</p> <p>a. <math>y = 2x + 1</math>                      b. <math>y = -2x + 1</math>                      c. <math>y = 2x - 1</math>                      d. <math>y = 2x^2 - 1</math></p>	$y = 2x - 1$
<b>43</b>	Find the longest side of this right-angled triangle leaving your answer as a surd. 	$5\sqrt{2} m$
<b>44</b>	Solve $11 - 2(1 + 3x) < 39$	$x > -5$
<b>45</b>	Solve $2\tan x + 5 = -4$ for $0^\circ < x < 180^\circ$	$x = 102.5^\circ, 282.5^\circ$

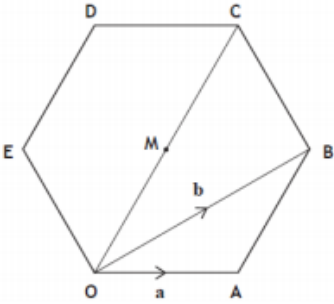
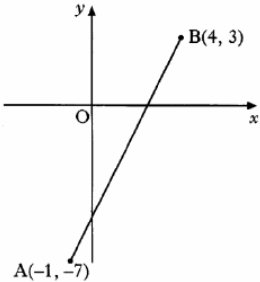
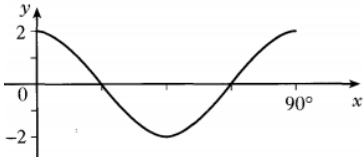
		Answers
<b>46</b>	<p>The standard deviation of</p> <p style="text-align: center;">1, 2, 2, 2, 8 is <math>\sqrt{a}</math></p> <p>Find a</p>	$a = 8$
<b>47</b>	<p>Multiply out the brackets and simplify</p> <p style="text-align: center;"><math>(3x + 2)(x^2 - 4x + 3)</math></p>	$3x^3 - 10x^2 + x + 6$
<b>48</b>	<p>The population of the UK is 64.1 million. If it increased by 3% for the next 7 years, what would it be?</p>	78.8 million (3 s.f.)
<b>49</b>	<p>The square below has side length <math>y</math>. If the diagonal is 6m. Find the exact length <math>y</math></p> <div style="text-align: center;">  </div>	$y = 3\sqrt{2}m$
<b>50</b>	<p>Show that</p> $\frac{1 - \cos^2 a}{\cos^2 a} = \tan^2 a$	<p>Use <math>\sin^2 a + \cos^2 a = 1</math> and <math>\tan x = \frac{\sin x}{\cos x}</math></p> <p style="text-align: center;">to prove LHS = RHS</p>

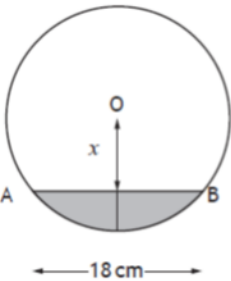
<b>Answers</b>
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		Answers
<b>51</b>	Evaluate $\frac{5}{12} \times 2\frac{2}{9}$ Give the answer in its simplest form	$\frac{25}{27}$
<b>52</b>	A straight line has gradient 4 and it passes through the points (2,4) and (1, a) Find the value of a	$a = 0$
<b>53</b>	Evaluate $2^0 + 3^{-1}$	$1\frac{1}{3}$
<b>54</b>	Change the subject of the formula to u $v^2 = u^2 + 2as$	$u = \sqrt{v^2 - 2as}$
<b>55</b>	What is the equation of the graph below? 	$y = 5\sin 3x$

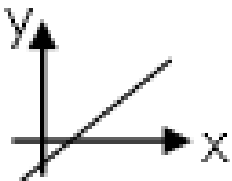
		Answers
<b>56</b>	<p>Calculate the capacity of the cylindrical mug below</p> 	$V = 1099\text{cm}^3$
<b>57</b>	<p>Factorise</p> $(100x^2 - 500x - 2400)$	$100(x - 8)(x + 3)$
<b>58</b>	<p>The restaurant bill included 8% tax. If the bill was £324, what was the bill <b>before</b> tax?</p>	<p>£300</p>
<b>59</b>	<p>Calculate angle PQR</p> 	<p>Angle PQR = 78.6°</p>
<b>60</b>	<p>Write down the turning point and the equation of the axis of symmetry</p> $y = (x - 3)^2 + 4$	$T.P. = (3, 4)$ $x = 3$

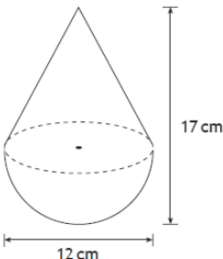
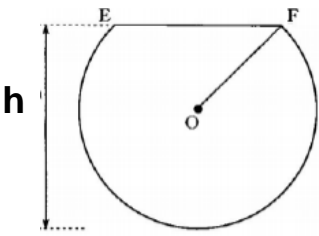
**Answers**

		Answers
61	<p>Express <math>\overrightarrow{AB}</math> in terms of a &amp; b</p> <p>Express <math>\overrightarrow{OC}</math> in terms of a &amp; b</p> 	$\overrightarrow{AB} = -a + b$ $\overrightarrow{OC} = 2(b - a)$
62	<p>Find the equation of this line</p> 	$y = 2x - 5$
63	<p>Find</p> $27^{\frac{2}{3}}$	$27^{\frac{2}{3}} = 9$
64	<p>Solve</p> $2x - 1 = \frac{x - 4}{3}$	$x = -\frac{1}{5}$
65	<p>What is the equation of the graph below</p> 	$y = 2\cos 4x$

		Answers
<b>66</b>	<p>Show that the s.d. of 1,1,1,2,5 is <math>\sqrt{3}</math> and write down the s.d. of 101,101,101,102,105</p>	<p>First part proof Second part <i>s. d. = same</i> = <math>\sqrt{3}</math></p>
<b>67</b>	<p>Multiply out and simplify</p> $2(x^2 - 4x + 3) - x(x - 3)$	$x^2 - 5x + 6$
<b>68</b>	<p>Rob normally cycles a total distance of 56 miles per week. He increases his distance by 15% each week for the next three weeks. How many miles will he cycle in the third week?</p>	<p>Miles in 3<sup>rd</sup> week = 85.169</p>
<b>69</b>	<p>Depth of water in the cylindrical tank is 5m Calculate the radius</p> 	$r = 10.6m$
<b>70</b>	<p>Show that</p> $\frac{\tan x}{\sin x} = \frac{1}{\cos x}$	<p>Use <math>\tan x = \frac{\sin x}{\cos x}</math> to prove LHS = RHS</p>

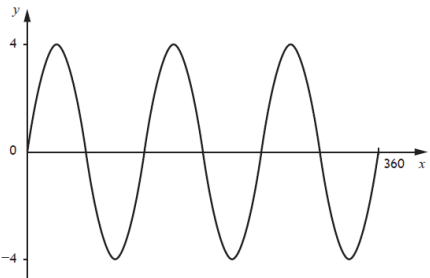
**Answers**

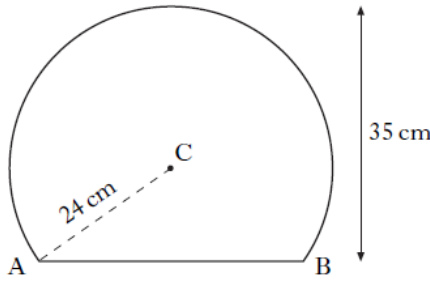
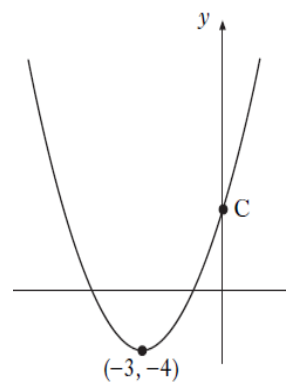
		Answers
71	Without using a calculator find 17.5% of £90	£15.75
72	For the straight-line equation $y = mx + c$  When $m > 0$ and $c < 0$ sketch a possible graph	
73	Simplify $\frac{6xy^3}{8x^4y^2}$	$\frac{3y}{4x^3}$
74	Write as a single fraction $\frac{2}{x} + \frac{4}{x-2}$	$\frac{6x-4}{x(x-2)}$
75	Solve the equation $11\cos x^\circ - 2 = 3$ for $(0 \leq x \leq 360^\circ)$	$x = 62.96^\circ, 297.04^\circ$

		Answers
<b>76</b>	Find volume to 2 s.f.  	$V = 870 \text{ cm}^3$
<b>77</b>	Factorise  $16x^2 - 1$	$(4x + 1)(4x - 1)$
<b>78</b>	A 900g box has 20% extra washing powder. How much washing powder was in a standard size box?	750g
<b>79</b>	EF = 18 m OF = radius = 15 m Find h  	$h = 27m$
<b>70</b>	Describe the nature of the roots $y = x^2 - 3x + 3$	There are no real roots



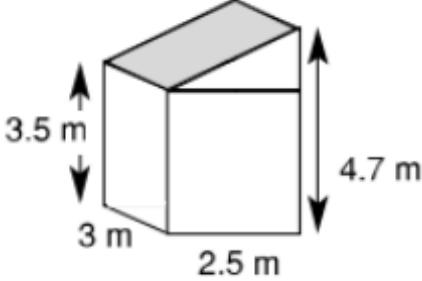
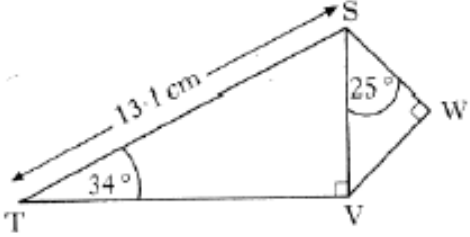
**Answers**

		Answers
<b>81</b>	Evaluate  $3\frac{2}{5} - 2\frac{1}{3}$	$1\frac{1}{15}$
<b>82</b>	Find the gradient and y-intercept for the straight line:  $3x - 17 = 15y$	$m = \frac{1}{5}, \quad c = -\frac{17}{15}$
<b>83</b>	Express the below with a rational denominator in its simplest form  $\frac{8}{\sqrt{8}}$	$2\sqrt{2}$
<b>84</b>	Change the subject of the formula to $R$  $P = R^3b - 5$	$R = \sqrt[3]{\frac{P + 5}{b}}$
<b>85</b>	State the equation of the graph below  	$y = 4\sin 3x$

		Answers
<b>86</b>	<p>Make two valid comparisons for the two maths scores:</p> <p>Class A: Mean = 65%, s.d. = 12% Class B: Mean = 59%, s.d. = 10%</p>	<ul style="list-style-type: none"> <li>• On average Class A have higher maths scores</li> <li>• Class A have less consistent marks</li> </ul>
<b>87</b>	<p>Factorise</p> $4a^2 - 60a - 136$	$4(a - 17)(a + 2)$
<b>88</b>	<p>A new car cost £25000. Its value was expected to decrease every year by 20%.</p> <p>Find its expected value after 7 years.</p>	<p>Value = £5248.88</p>
<b>89</b>	<p>Find the length AB</p>  <p>The diagram shows a circular sector with center C. A dashed line from C to point A is labeled 24 cm. A vertical line from C to the chord AB is labeled 35 cm. Points A and B are on the circumference, and AB is a horizontal chord.</p>	$AB = 42.66 \text{ cm}$
<b>90</b>	<p>Below is a graph of</p> $y = (x - a)^2 + b$ <p>Find coordinates of c</p>  <p>The graph shows a parabola opening upwards on a Cartesian coordinate system. The vertex is marked with a dot at the coordinates (-3, -4). Another point C is marked on the parabola at the coordinates (0, 5).</p>	$C (0, 5)$

**N5 Self Check  
Ten**

		Answers
<b>91</b>	Find $ u $ , the magnitude of $u = \begin{bmatrix} 6 \\ -13 \\ 18 \end{bmatrix}$	$ u  = 23$
<b>92</b>	Find the equation of a straight line between $(-7, 4)$ and $(-3, 5)$	$4y - x = 23$
<b>93</b>	Express in its simplest form $y^8 \times (y^3)^{-2}$	$y^2$
<b>94</b>	Solve for $y$ $\frac{2(y - 3)}{4} = \frac{y + 5}{3}$	$y = 19$
<b>95</b>	Solve algebraically the equation $\sqrt{3} \sin x^\circ - 1 = 0$ for $0 \leq x \leq 360$	$x = 35.5^\circ, 144.7^\circ$

		Answers
<b>96</b>	<p>Find the total volume of the shape below.</p> 	$V = 30.75m^3$
<b>97</b>	<p>Multiply out and simplify</p> $(y - 2)^3$	$y^3 - 6y^2 + 12y - 8$
<b>98</b>	<p>I bought a new racing bike for £1500. This included VAT at 20%. What was the cost before VAT was added?</p>	Cost = £1250
<b>99</b>	<p>Find the length SW</p> 	$SW = 6.6cm$
<b>100</b>	<p>Express</p> $x^2 - 14x + 44$ <p>in the form</p> $(x - a)^2 + b$	$(x - 7)^2 - 5$