

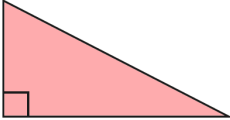
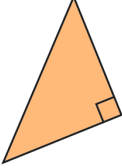

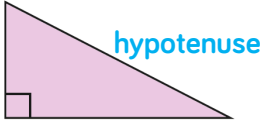
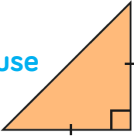
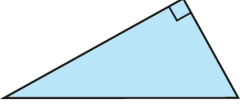
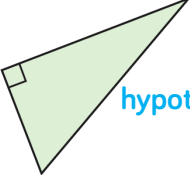
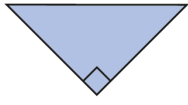
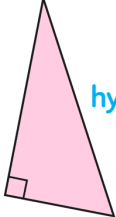
Y9 - Spring - Block 6 - Step 1 - Squares and square roots Answers

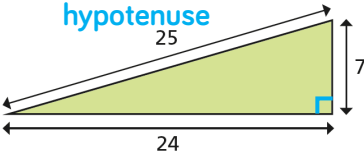
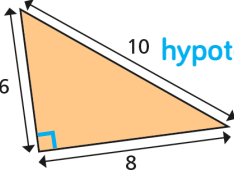
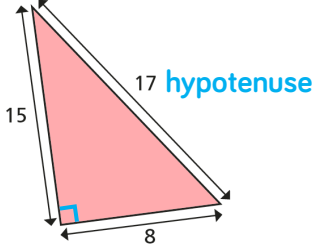
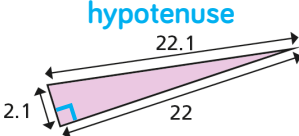
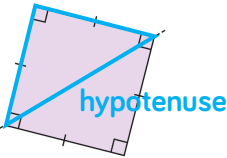
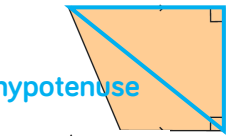
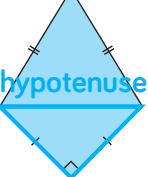
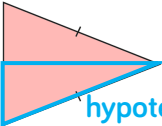
Question	Answer
1	a) $4^2 = 4 \times 4 = 16$ b) $5^2 = 5 \times 5 = 25$ c) $6^2 = 6 \times 6 = 36$ d) $10^2 = 10 \times 10 = 100$
2	a) 16 square units b) 25 square units c) 36 cm^2 d) 100 cm^2
3	The numbers are the same.
4	a) 4 mm b) 2 cm c) 7 m d) 3 km
5	a) If $4^2 = 16$ then $\sqrt{16} = 4$ b) If $5^2 = 25$ then $\sqrt{25} = 5$ c) If $6^2 = 36$ then $\sqrt{36} = 6$ d) If $10^2 = 100$ then $\sqrt{100} = 10$
6	a) $>$ b) $<$ c) $<$ d) $>$ e) $>$ f) $=$
7	a) $>$ b) $<$ c) $<$ d) $=$ e) $<$ f) $>$ Students could have answered the first few parts by estimating. They may be surprised by the effect of squaring a number less than 1
8	a) x^2 b) sometimes true A square number is defined as an integer that is a perfect square, so the area will only be a square number when the side of the square is an integer.

Y9 – Spring – Block 6 – Step 1 – Squares and square roots Answers (continued)

Question	Answer
9	Alex's conjecture is not true. multiple possible examples, e.g.: $a = 1, b = 2$ $a^2 + b^2 = 1 + 4 = 5$ $(a + b)^2 = 3^2 = 9$
10	sometimes true When the number is greater than 1, the square of the number is greater than the number. When the number is equal to 1, the square of the number is equal to the number. When the number is less than 1, the square of the number is less than the number Students could be stretched to consider what changes when negative numbers are considered.
11	Brett A length cannot be a negative number.

Y9 - Spring - Block 6 - Step 2 - Identify the hypotenuse of a right-angled triangle Answers

Question	Answer
1	<p>a) Measurements vary depending on how the worksheet is printed.</p>  <p>b) Measurements vary depending on how the worksheet is printed.</p>  <p>c) Measurements vary depending on how the worksheet is printed.</p>  <p>Students should notice the longest side is opposite the right-angle.</p>
2	<p>a)  hypotenuse</p> <p>b)  hypotenuse</p> <p>c)  hypotenuse</p> <p>d)  hypotenuse</p> <p>e)  hypotenuse</p> <p>f)  hypotenuse</p>

Question	Answer
3	<p>a)  hypotenuse 25</p> <p>b)  hypotenuse 10</p> <p>c)  hypotenuse 17</p> <p>d)  hypotenuse 22.1</p>
4	<p>No. The triangle is not a right-angled triangle, so it does not have a hypotenuse.</p>
5	<p>a) false Only right-angled triangles have a hypotenuse.</p> <p>b) true</p> <p>c) true</p>
6	<p>multiple possible answers, e.g.:</p> <p>a)  hypotenuse</p> <p>b)  hypotenuse</p> <p>c)  hypotenuse</p> <p>d)  hypotenuse</p>

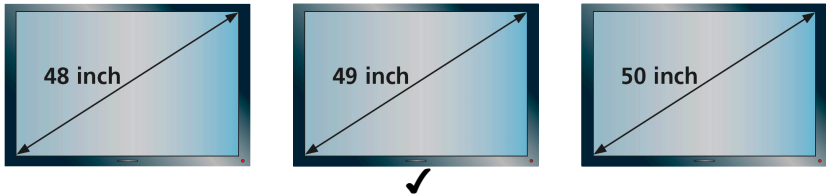
Y9 – Spring – Block 6 – Step 2 – Identify the hypotenuse of a right-angled triangle Answers (continued)

Question	Answer
7	<p data-bbox="211 194 762 250">the horizontal distance between Whitney and the kite</p> <p data-bbox="211 292 762 348">the distance between Whitney and the base of the kite ✓</p> <p data-bbox="211 389 762 445">the vertical distance between Whitney and the kite</p>
8	<p data-bbox="211 497 268 524">Yes.</p> <p data-bbox="211 534 1349 602">The angle sum in a triangle is 60 degrees meaning that the unlabelled angle at C is 60°, so angle ACB is 90°. AB is the side opposite angle ACB.</p>

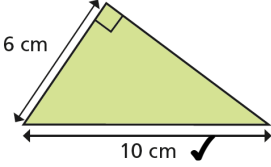
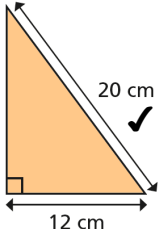
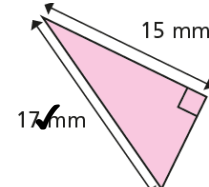
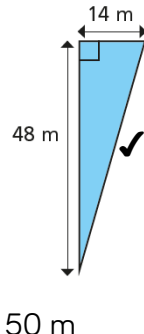
Y9 – Spring – Block 6 – Step 3 – Determine whether a triangle is right-angled Answers

Question	Answer																																								
1	<table border="1"> <thead> <tr> <th>Triangle</th> <th>a</th> <th>b</th> <th>hyp</th> <th>a^2</th> <th>b^2</th> <th>hyp²</th> <th>$a^2 + b^2$</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>3</td> <td>4</td> <td>5</td> <td>9</td> <td>16</td> <td>25</td> <td>25</td> </tr> <tr> <td>B</td> <td>7.5</td> <td>4</td> <td>8.5</td> <td>56.25</td> <td>16</td> <td>72.25</td> <td>72.25</td> </tr> <tr> <td>C</td> <td>6</td> <td>4.5</td> <td>7.5</td> <td>36</td> <td>20.25</td> <td>56.25</td> <td>56.25</td> </tr> <tr> <td>D</td> <td>2.5</td> <td>6</td> <td>6.5</td> <td>6.25</td> <td>36</td> <td>42.25</td> <td>42.25</td> </tr> </tbody> </table>	Triangle	a	b	hyp	a^2	b^2	hyp ²	$a^2 + b^2$	A	3	4	5	9	16	25	25	B	7.5	4	8.5	56.25	16	72.25	72.25	C	6	4.5	7.5	36	20.25	56.25	56.25	D	2.5	6	6.5	6.25	36	42.25	42.25
	Triangle	a	b	hyp	a^2	b^2	hyp ²	$a^2 + b^2$																																	
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<p>They are equal. The square of the hypotenuse is equal to the sum of the squares of the other two sides.</p>																																									
2	<table border="1"> <thead> <tr> <th>Triangle</th> <th>x</th> <th>y</th> <th>z</th> <th>x^2</th> <th>y^2</th> <th>z^2</th> <th>$x^2 + y^2$</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>3.2</td> <td>3.9</td> <td>4.5</td> <td>10.24</td> <td>15.21</td> <td>20.25</td> <td>25.45</td> </tr> <tr> <td>B</td> <td>6</td> <td>3.7</td> <td>8.4</td> <td>36</td> <td>13.69</td> <td>70.56</td> <td>49.69</td> </tr> <tr> <td>C</td> <td>4</td> <td>2.4</td> <td>5.1</td> <td>16</td> <td>5.76</td> <td>26.01</td> <td>21.76</td> </tr> <tr> <td>D</td> <td>6.9</td> <td>5.8</td> <td>6.9</td> <td>47.61</td> <td>33.64</td> <td>47.61</td> <td>81.25</td> </tr> </tbody> </table>	Triangle	x	y	z	x^2	y^2	z^2	$x^2 + y^2$	A	3.2	3.9	4.5	10.24	15.21	20.25	25.45	B	6	3.7	8.4	36	13.69	70.56	49.69	C	4	2.4	5.1	16	5.76	26.01	21.76	D	6.9	5.8	6.9	47.61	33.64	47.61	81.25
	Triangle	x	y	z	x^2	y^2	z^2	$x^2 + y^2$																																	
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D	6.9	5.8	6.9	47.61	33.64	47.61	81.25																																		
<p>They are not equal. The square of the longest side is not equal to the sum of the squares of the two shorter sides if the triangle is not right-angled.</p>																																									
3	a) $7^2 + 24^2 = 49 + 576 = 625 = 25^2$																																								
	b) $6^2 + 8^2 = 36 + 64 = 100 = 10^2$																																								
	c) $8^2 + 15^2 = 64 + 225 = 289 = 17^2$																																								
	d) $2.1^2 + 22^2 = 4.41 + 484 = 488.41 = 22.1^2$																																								
4	triangle A: $5^2 + 10^2 = 25 + 100 = 125 \neq 12^2$																																								
	triangle B: $5^2 + 12^2 = 25 + 144 = 169 = 13^2$																																								
	triangle C: $4^2 + 12^2 = 16 + 144 = 160 \neq 13^2$																																								
	Triangle B is right-angled because $5^2 + 12^2 = 13^2$																																								
5	No. $5^2 + 7.5^2 = 81.25$ $81.25 \neq 9^2$																																								
	No. side of pentagon = 13.6 cm side of hexagon = 15 cm side of square = 10 cm $10^2 + 13.6^2 = 284.96$ $284.96 \neq 15^2$																																								

Y9 – Spring – Block 6 – Step 4 – Calculate the hypotenuse of a right-angled triangle Answers

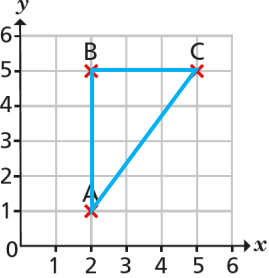
Question	Answer
1	a) 9 and 16 b) 25 It is equal to the sum of the other two squares. c) 5
2	a) 10 cm b) 13 cm c) 17 mm d) 25 m
3	a) 8.5 cm b) 649.4 mm c) 0.8 m d) 12.7 cm
4	24.7 cm
5	a) Dani b) 45 m
6	 <p> $25^2 + 43^2 = 2,474$ $\sqrt{2,474} = 49.7$ inches </p>
7	No. side of large square = $8 \div 4 = 2$, so side of right-angled triangle = 1 side of small square = $\sqrt{1^2 + 1^2} = 1.41$ m, so perimeter is 5.64 Some students may divide 4 by 4 for the proposed side of the small square and compare this number to 1.41
8	40.6 m
9	hypotenuse of triangle A = $\sqrt{36^2 + 48^2} = 60$ cm hypotenuse of triangle C = $\sqrt{64^2 + 48^2} = 80$ cm The sides of triangle B are 60 cm, 80 cm and $36 + 64 = 100$ cm. $60^2 + 80^2 = 100^2$

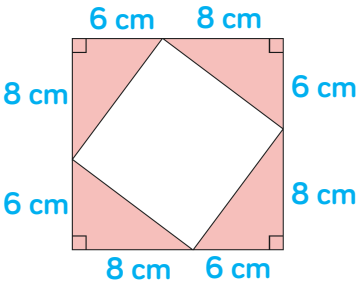
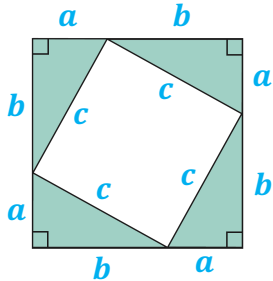
Y9 - Spring - Block 6 - Step 5 - Calculate missing sides in right-angled triangles Answers

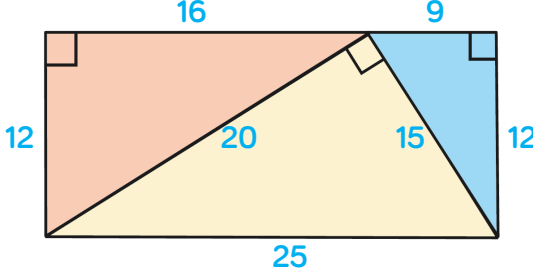
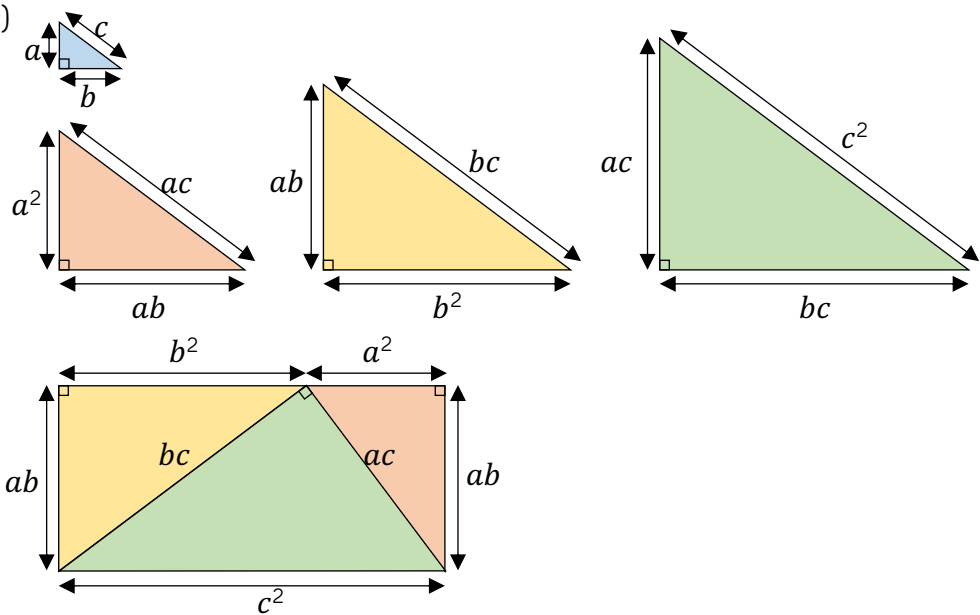
Question	Answer
1	<p>a) $9^2 + 12^2 = x^2$ ✓ $x^2 + 9^2 = 12^2$ $x^2 + 12^2 = 9^2$</p> <p>b) $9^2 + 12^2 = x^2$ $x^2 + 9^2 = 12^2$ ✓ $x^2 + 12^2 = 9^2$</p> <p>The numbers are the same, but the unknown length is on its own on one side of the equation in part a), and with one of the other numbers in part b).</p>
2	<p>a) </p> <p>b) </p> <p>c) </p> <p>d) </p>
3	<p>a) 5.1 cm b) 589.8 mm c) 0.6 m d) 10.5 cm</p>
4	7.1 cm

Y9 - Spring - Block 6 - Step 5 - Calculate missing sides in right-angled triangles Answers (continued)

Question	Answer
5	She has used the length of the hypotenuse as the height. She needs to calculate to missing side in the triangle and use this for the height.
6	22.2 mm ²
7	3.87 m
8	23.3 cm
9	19.6 cm

Question	Answer
1	<p>a) The distance between points A and B is 4 units. The distance between points A and B is 3 units.</p> <p>b) </p> <p>c) 5 units</p>
2	<p>DE = 4.5 units HI = 6.1 units FG = 4.2 units JK = 4.5 units DE and JK both have 2 units in one direction and 4 units in the other, so the lengths are the same. DE is 2 units in the x-direction and 4 units in the y-direction, while JK is 4 units in the x-direction and 2 units in the y-direction. The two lines are perpendicular.</p>
3	<p>a) 10 units b) 5 units c) 1.4 units d) 5.4 units</p>
4	<p>a) 4.5 units b) 5.8 units c) 13 units</p>
5	<p>a) 4.47 units b) 13.9 units c) 9.49 units d) 35.6 units</p>
6	<p>Approx 128 km</p>
7	<p>18.97 units</p>
8	<p>2.11 units</p>
9	<p>$m = 9$ or $m = -3$</p>

Question	Answer												
1	<p>a)</p> <table border="1" data-bbox="258 188 1048 430"> <thead> <tr> <th>Area of A</th> <th>Area of B</th> <th>Area of C</th> </tr> </thead> <tbody> <tr> <td>30</td> <td>10</td> <td>40</td> </tr> <tr> <td>35</td> <td>15</td> <td>50</td> </tr> <tr> <td>7</td> <td>2</td> <td>9</td> </tr> </tbody> </table> <p>b) 100 cm^2 c) If the side length of A is a and the side length of B is b, the area of A is a^2, the area of B is b^2 and the area of C is $a^2 + b^2$</p>	Area of A	Area of B	Area of C	30	10	40	35	15	50	7	2	9
Area of A	Area of B	Area of C											
30	10	40											
35	15	50											
7	2	9											
2	<p>a)</p>  <p>b) 196 cm^2 c) 24 cm^2 d) 100 cm^2 It is the area of the large square minus $4 \times$ the area of the right-angled triangle. e) 10 cm It is the same.</p>												
3	<p>a)</p>  <p>b) $(a + b)^2$ c) $\frac{1}{2}ab$ d) $(a + b)^2 - 4 \times \frac{1}{2}ab = a^2 + 2ab + b^2 - 2ab = a^2 + b^2$ $a^2 + b^2 = c^2$</p>												

Question	Answer
4	<p>a)</p>  <p>b) rectangle Opposite sides are equal and the angles are all right angles.</p> <p>c)</p>  <p>Opposite sides of the rectangle are equal, so $a^2 + b^2 = c^2$</p>

Y9 – Spring – Block 6 – Step 8 – Use Pythagoras' theorem in 3D shapes Answers

Question	Answer
1	a) true The face of a cuboid is a rectangle, so the angle of the triangle is a right angle. b) 10 cm c) 9.22 cm d) 10.6 cm e) 12.2 cm
2	7 cm
3	8.66 cm
4	4.04 cm
5	18.6 km ³
6	No. $25^2 + 10^2 = 725$ $\sqrt{725} = 26.9$ The largest diagonal in the tube is 26.9 cm, which is less than the length of the spaghetti.
7	11.4 cm