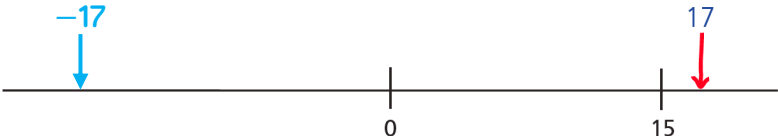
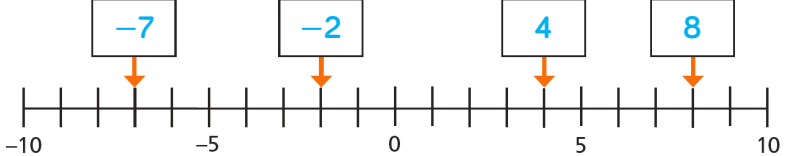
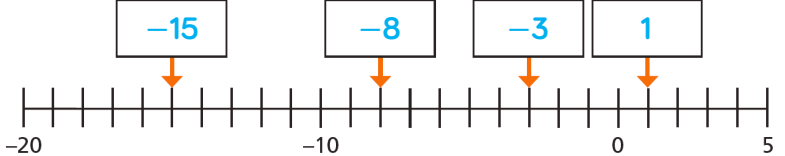
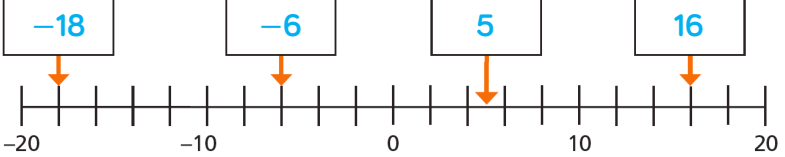
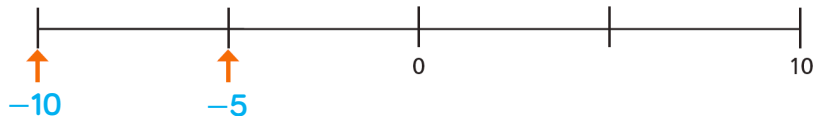
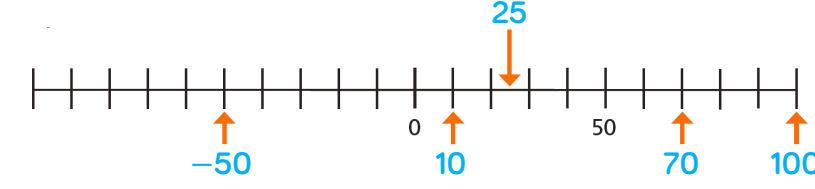

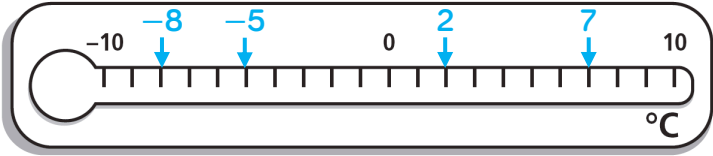
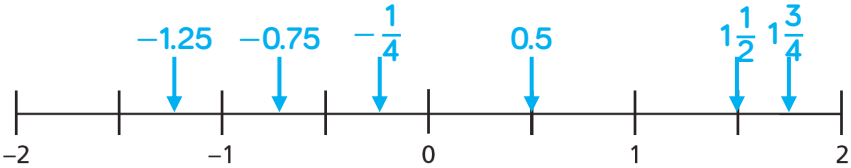


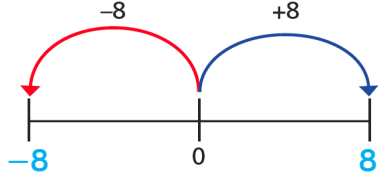
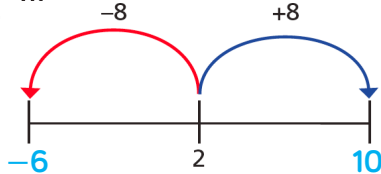
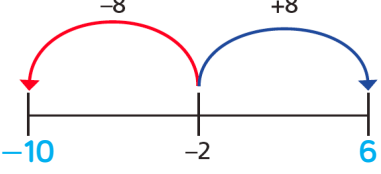
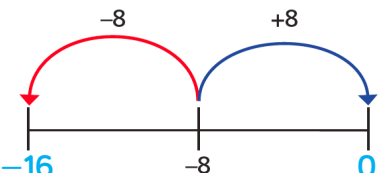
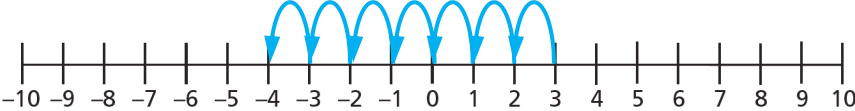
Question	Answer
1	a) 2 -2 b) 4 -4 c) 7 -7 d) 11 -11
2	2 -3 -1 4 -1 is one away from zero.
3	a)  b) It is the same distance from zero as 17, but in the opposite direction.
4	a)  b)  c) 

Question	Answer
5	<p>a) </p> <p>b) </p> <p>c) </p>
6	<p>a) $\frac{1}{2}$</p> <p>b) $\frac{1}{5}$</p> <p>c) $\frac{1}{7}$</p>
7	<p>a) -42</p> <p>b) 300</p>
8	<p>a) -15°F</p> <p>b) 45°F</p>
9	<p>a) -10, -5, 0, 5, 10</p> <p>b) -11, -9, -7, -5, -3, -1, 1, 3, 5</p> <p>c) 16, 12, 8, 4, 0, -4, -8, -12</p> <p>d) -1, -0.8, -0.6, -0.4, -0.2, 0, 0.2</p>

Question	Answer
1	<p>a) </p> <p>b) 7°C, 2°C, -5°C, -8°C</p>
2	<p>a) $<$ b) $>$ c) $>$ d) $<$ e) $>$ f) $<$ g) $>$ h) $<$ i) $>$ j) $<$</p>
3	<p>-772, -727, -77, -72, 277, 727 For the negative numbers, the higher value of the digits means that the number is smaller.</p>
4	<p>multiple possible answers, e.g.: a) 6, 11, 13 b) -19, -16, -11 c) -9, -5, -1</p>
5	
6	<p>-7.5 is more negative than -7, therefore it is less than -7</p>
7	<p>a) 0.2 b) -200.2</p>
8	<p>a) $-2.4 < -2$ $2.4 > -2$ $-2.4 < 2$ b) $17.25 > -17.05$ $-17.25 < -17.05$ $-17.25 < 17.05$ c) $-101.3 < 101.31$ $101.3 > -101.31$ $-101.3 > -101.31$</p>
9	<p>multiple possible answers, e.g.: -2, -1.95, 3.2 The possible integers are: -2, -1, 0, 1, 2, 3, 4, 5, 6</p>

Y7 – Spring – Block 4 – Step 2 – Order directed numbers using lines and appropriate symbols Answers
(continued)

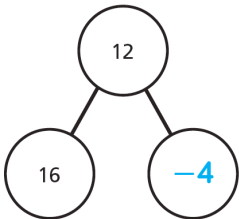
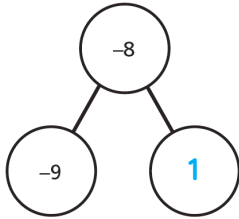
Question	Answer
10	<p>multiple possible answers, e.g.:</p> <p>a) $-7.5 > -7.65$ $-7.5 < -7.15$</p> <p>b) $-6.25 < -31.23$ $-6.25 > -81.23$</p> <p>c) $-7.32 < -7.23 < -6.37 < -6.23 < -2.72$</p> <p>For part a), the missing digit can be 5, 6, 7, 8 or 9 in the first inequality and 0, 1, 2, 3 or 4 in the second inequality.</p> <p>There are a large number of different possible answers for parts b) and c).</p>
11	<p>a) hydrogen</p> <p>b) hydrogen, neon, fluorine, oxygen, nitrogen, sodium, magnesium, boron, carbon</p>

Question	Answer
1	a) $-4 + 9 = 5$ b) $4 - 11 = -7$
2	a)  b)  c)  d) 
3	 Start at 3 and count back 7
4	a) 2 b) -2 c) 2 d) -2 e) -8 f) -6 g) 8 h) 9
5	a) $5 - 9 = -4$ $-5 - 9 = -14$ $-5 + 9 = 4$ b) $1 - 8 = -7$ $-1 - 6 = -7$ $-1 + 8 = 7$ c) $-28 = -12 - 16$ $-28 = -44 + 16$ $28 = 44 - 16$ d) $-4 + 34 - 43 = -13$ $102 = -9 + 111$ $-20 = -59 - 7 + 46$
6	He has added 2 to negative 3 instead of subtracted it. -5

Y7 – Spring – Block 4 – Step 3 – Perform calculations that cross zero Answers (continued)

Question	Answer
7	a) -7°C b) -4°C c) 12°C
8	27
9	a) $-10, -7, -4, -1, 2, 5$ b) $9, 2, -5, -12, -19$ c) $-19, -24, -29, -34, -39, -44$ d) $-2, -1.5, -1, -0.5, 0, 0.5, 1$
10	a) $-4a$ b) $-6b$ c) $-0.5d$ d) $-22e$ e) $-g$ f) $0.7k$
11	a) multiple possible answers, e.g.: $-3, 0, 5, 8$ b) five possible integer solutions: $-3, -2, 7, 8$ $-3, -1, 6, 8$ $-3, 0, 5, 8$ $-3, 1, 4, 8$ $-3, 2, 3, 8$ There is an infinite number of solutions if the numbers are not all integers. The first number must be -3 and the middle two numbers must add up to 5

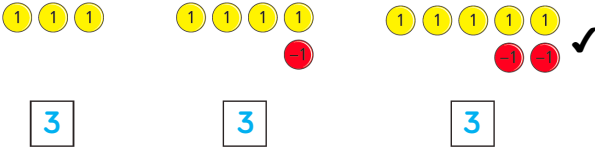
Y7 - Spring - Block 4 - Step 4 - Add directed numbers Answers

Question	Answer
1	a) 0 b) -1 c) 1 d) 0 e) -2
2	a) $3 + -5 = -2$ b) $5 + -3 = 2$ c) $2 + -7 = -5$ d) $-2 + 5 = 3$
3	a) -5 b) -5 c) 5 d) -7
4	-8
5	a) 5 -11 -5 -11 b) -1 -13 13 1
6	a)  b) 
7	a) -7 b) -12 c) 12 d) -6

Y7 – Spring – Block 4 – Step 4 – Add directed numbers Answers (continued)

Question	Answer
8	<p>a) -36 $372 + -408 = 372 - 408$ possible methods include: Work out $372 - 408$ Work out $408 - 372$ and then make the answer negative</p> <p>b) -15 -42 -5 -236 -818</p>
9	<p>It is possible. 3 correct answers, 8 incorrect answers and 9 unanswered questions: $21 + -32 + 0 = -11$</p>
10	<p>a) $-4m$ b) $-16m$ c) $4m$ d) $-4m$ e) $-21m$ f) $-20m$</p>

Y7 – Spring – Block 4 – Step 5 – Subtract directed numbers Answers

Question	Answer
1	a) -3 b) -6 c) -9 The value goes up by 1
2	a) -4 b) -3 c) -2 d) 0
3	0
4	 <p>There are 2 negative counters to take away.</p> <p>5</p>
5	4 6 7 Subtracting a negative number makes the value go up.
6	$4 - 4 = 0$ $4 - 3 = 1$ $4 - 2 = 2$ $4 - 1 = 3$ $4 - 0 = 4$ $4 - (-1) = 5$ $4 - (-2) = 6$ $4 - (-3) = 7$ $4 - (-4) = 8$ Adding a negative number is the same as adding the positive number.
7	He has added the values, but ignored the signs. He has seen two negatives and wrongly assumed that they make a positive. $-5 - 4 = -9$

Y7 – Spring – Block 4 – Step 5 – Subtract directed numbers Answers (continued)

Question	Answer
8	a) -7 b) -5 c) 9 d) 8 e) -5 f) 7 g) -9 h) 5 i) -13 j) -7
9	a) 19 b) 3 c) 3 d) -13 e) -3 f) -19 g) 13 h) -3
10	a) -2 b) -24 c) -16 d) 2
11	multiple possible answers, e.g.: a) $8 - (-9) = 20 - 3$ b) $4 - 3 = -8 - (-9)$ c) $-9 - -9 = -8 - (-8)$ There is an infinite number of solutions.
12	8°C

Y7 – Spring – Block 4 – Step 6 – Multiplication of directed numbers Answers

Question	Answer																																																																
1	a) 20 $4 \times 5 = 20$ b) -20 $4 \times -5 = -20$ c) Both Dexter and Whitney have 4 cups and 5 counters. Dexter's counters have value 1 and Whitney's have value -1 and their totals have opposite signs.																																																																
2	$7 \times -8 = -56$																																																																
3	a) $-3 \times 5 = -15$ $5 \times -3 = -15$ b) $-5 \times 4 = -20$ $4 \times -5 = -20$																																																																
4	$-4 \times 4 = -16$ $-4 \times 3 = -12$ $-4 \times 2 = -8$ $-4 \times 1 = -4$ $-4 \times 0 = 0$ $-4 \times -1 = 4$ $-4 \times -2 = 8$ $-4 \times -3 = 12$ $-4 \times -4 = 16$ Multiplying a positive number and a negative number gives a negative number. Multiplying two negative numbers gives a positive number.																																																																
5	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>x</th> <th>3</th> <th>2</th> <th>1</th> <th>0</th> <th>-1</th> <th>-2</th> <th>-3</th> </tr> </thead> <tbody> <tr> <th>3</th> <td>9</td> <td>6</td> <td>3</td> <td>0</td> <td>-3</td> <td>-6</td> <td>-9</td> </tr> <tr> <th>2</th> <td>6</td> <td>4</td> <td>2</td> <td>0</td> <td>-2</td> <td>-4</td> <td>-6</td> </tr> <tr> <th>1</th> <td>3</td> <td>2</td> <td>1</td> <td>0</td> <td>-1</td> <td>-2</td> <td>-3</td> </tr> <tr> <th>0</th> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <th>-1</th> <td>-3</td> <td>-2</td> <td>-1</td> <td>0</td> <td>1</td> <td>2</td> <td>3</td> </tr> <tr> <th>-2</th> <td>-6</td> <td>-4</td> <td>-2</td> <td>0</td> <td>2</td> <td>4</td> <td>6</td> </tr> <tr> <th>-3</th> <td>-9</td> <td>-6</td> <td>-3</td> <td>0</td> <td>3</td> <td>6</td> <td>9</td> </tr> </tbody> </table> <p>Multiplying two numbers with the same sign gives a positive number. Multiplying two numbers with different signs gives a negative number.</p>	x	3	2	1	0	-1	-2	-3	3	9	6	3	0	-3	-6	-9	2	6	4	2	0	-2	-4	-6	1	3	2	1	0	-1	-2	-3	0	0	0	0	0	0	0	0	-1	-3	-2	-1	0	1	2	3	-2	-6	-4	-2	0	2	4	6	-3	-9	-6	-3	0	3	6	9
x	3	2	1	0	-1	-2	-3																																																										
3	9	6	3	0	-3	-6	-9																																																										
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-3	-9	-6	-3	0	3	6	9																																																										

Y7 – Spring – Block 4 – Step 6 – Multiplication of directed numbers Answers (continued)

Question	Answer
6	a) $5 \times 6 = 30$ $-5 \times 6 = -30$ $5 \times -6 = -30$ $-5 \times -6 = 30$ b) $-3 \times 4 = -12$ $-4 \times -3 = 12$ c) $-5 \times -8 = 40$ $-5 \times 8 = -40$
7	$-3 \times 5 \times 2 = -30$ $3 \times 2 \times -5 = -30$ $-5 \times -2 \times 3 = 30$ $-3 \times -2 \times -5 = -30$
8	a) 4 b) -3 c) -6 d) 4 e) -2 f) -1
9	a) $-3 \times 4 = -4 \times 3$ <input checked="" type="checkbox"/> c) $(-5)^2 = 5^2$ <input checked="" type="checkbox"/> b) $8 \times 5 = -5 \times -8$ <input checked="" type="checkbox"/> d) $-5^2 = (-5)^2$ <input type="checkbox"/>
10	multiple possible answers, e.g.: $-1, -2, 24$ $8, -2, -3$ Two of the numbers must be negative and the other number must be positive. It is not possible for all three numbers to be negative, as the product of three negative numbers is negative.

Question	Answer
1	a) -4 -2 b) -5 -2 c) -6 -3
2	$3 \times -5 = -15$ $5 \times -3 = -15$ $-15 \div 3 = -5$ $-15 \div 5 = -3$
3	a) $-4 \times 3 = -12$ $3 \times -4 = -12$ $-12 \div 3 = -4$ $-12 \div -4 = 3$ b) $-18 \div 6 = -3$ $-18 \div -3 = 6$
4	-5 -3
5	$-3 \div 1 = -3$ $-3 \div -1 = 3$ $-2 \div 1 = -2$ $-3 \div -1 = 2$ $-1 \div 1 = -1$ $-3 \div -1 = 1$ $0 \div 1 = 0$ $0 \div -1 = 0$ A negative number divided by a positive number is negative. A negative number divided by a negative number is positive.
6	a) 7 b) 8 c) 4 d) 5
7	a) $-3 \times -7 = 21$ $-3 \times 7 = -21$ $21 \div -7 = -3$ $-21 \div -3 = 7$ b) $-10 \times -13.4 = 134$ $-13.4 \times 10 = -134$ $134 \div -10 = -13.4$ $-134 \div -13.4 = 10$
8	-4×8 $8 \div -4$ $-8 \div -4$ -8×-4
9	a) 36 b) -1 c) -9 d) -360 e) -1.5 f) multiple possible answers, e.g.: $32 \div -8 = 24 \div -6$

Question	Answer																		
10	<p>a)</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td colspan="3" style="text-align: center;">-72</td> </tr> <tr> <td style="text-align: center;">-6</td> <td style="text-align: center;">12</td> <td></td> </tr> <tr> <td style="text-align: center;">3</td> <td style="text-align: center;">-2</td> <td style="text-align: center;">-6</td> </tr> </table> <p>b)</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td colspan="3" style="text-align: center;">80</td> </tr> <tr> <td style="text-align: center;">-10</td> <td style="text-align: center;">-8</td> <td></td> </tr> <tr> <td style="text-align: center;">10</td> <td style="text-align: center;">-1</td> <td style="text-align: center;">8</td> </tr> </table>	-72			-6	12		3	-2	-6	80			-10	-8		10	-1	8
-72																			
-6	12																		
3	-2	-6																	
80																			
-10	-8																		
10	-1	8																	
11	<p>multiple possible answers, e.g: -8, -2, 3, 6, 24 eleven possible integer answers: -24, -18, 1, 2, 8 -24, -12, 1, 3, 8 -24, -6, 1, 4, 8 -16, -9, 2, 2, 16 -16, -6, 2, 3, 16 -16, -3, 2, 6, 16 -16, -2, 2, 9, 16 -8, -4, 3, 3, 24 -8, -3, 3, 4, 24 -8, -2, 3, 6, 24 -8, -1, 3, 12, 24</p>																		

Y7 – Spring – Block 4 – Step 8 – Use a calculator for directed number calculations Answers

Question	Answer
1	a) 289 289 -289 b) 625 625 -625 c) 961 961 -961 d) 84.64 84.64 -84.64 The square of both positive and negative numbers is positive, because the product of two negative numbers is positive.
2	a) 17.42 b) -9.1 c) 11.891 d) -26.68 e) 0.0256 f) -1
3	They are all the equivalent of $3 \div 8$, where the numbers are opposite signs. $-\frac{3}{8} = -0.375$ $-3 \div 8 = -0.375$ $3 \div -8 = -0.375$
4	a) > b) > c) <
5	75.656 14.87
6	-94.36 47
7	a) $29.09h - 33m$ b) $58.02g - 63.4y$ c) $4.77p^3 - 1.77p^2$
8	a) 9.88 13.94 18 b) -0.562 -0.626 -0.69

Question	Answer																		
9	a) -93.312 335.9232 $-1,209.32352$ b) -10.7125 -5.35625 -2.678125 The terms in the sequence in part a) alternate between positive and negative numbers, because the multiplier for the sequence is negative. The terms in the sequence in part b) will always be negative, because each term is a negative number divided by a positive number.																		
10	a) -7.5 7.5 b) -16.02 -19.62																		
11	a) <table border="1"> <tr> <td>-0.2</td> <td>-0.6</td> <td>2</td> </tr> <tr> <td>2.6</td> <td>0.4</td> <td>-1.8</td> </tr> <tr> <td>-1.2</td> <td>1.4</td> <td>1</td> </tr> </table> b) <table border="1"> <tr> <td>-0.05</td> <td>1</td> <td>0.02</td> </tr> <tr> <td>0.04</td> <td>-0.1</td> <td>0.25</td> </tr> <tr> <td>0.5</td> <td>0.01</td> <td>-0.2</td> </tr> </table>	-0.2	-0.6	2	2.6	0.4	-1.8	-1.2	1.4	1	-0.05	1	0.02	0.04	-0.1	0.25	0.5	0.01	-0.2
-0.2	-0.6	2																	
2.6	0.4	-1.8																	
-1.2	1.4	1																	
-0.05	1	0.02																	
0.04	-0.1	0.25																	
0.5	0.01	-0.2																	
12	multiple possible answers, e.g.: <table border="1"> <tr> <td>-0.1</td> <td>1.5</td> <td>0.1</td> </tr> <tr> <td>0.7</td> <td>0.5</td> <td>0.3</td> </tr> <tr> <td>0.9</td> <td>-0.5</td> <td>1.1</td> </tr> </table> Every row, column and diagonal must sum to 1.5	-0.1	1.5	0.1	0.7	0.5	0.3	0.9	-0.5	1.1									
-0.1	1.5	0.1																	
0.7	0.5	0.3																	
0.9	-0.5	1.1																	

Question	Answer
1	a) -7 b) -12 c) -4 d) -12 All the expressions use addition and multiplication. In the first expression in each part, y is multiplied by a number and then added to another number. In the second expression, y is added to a number and then multiplied by another number.
2	a) -9 b) -23 c) -54 d) -54
3	Jack Rosie has worked out $5 - 4 \times 2$, not $5 - 4 \times -2$
4	a) 2 b) -30 c) 30 d) -2
5	a) -2 -14 14 b) -30 -60 -15 c) -8 16 -24
6	multiple possible answers, e.g.: a) $y - x$ b) xy c) $x - y - z$ d) xyz Where students have different expressions, they can substitute the values to check each other's expressions.
7	In the second line, he has only squared the 3 instead of -3 $-7 - -3^2$ $= -7 - 9$ $= -16$ He could write brackets round the number being squared: $(-3)^2$
8	64

Y7 - Spring - Block 4 - Step 9 - Evaluate algebraic expressions with directed numbers Answers
(continued)

Question	Answer
9	a) -6°C b) 30°F
10	If x is positive, $y + x$ has the greater value. If x is negative, $y - x$ has the greater value.

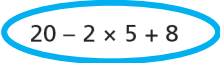
Y7 - Spring - Block 4 - Step 10 - Introduction to two-step equations Answers

Question	Answer								
1	a) $y + 37 = 52$ $y = 15$ b) $4m = 104$ $m = 26$								
2	She has subtracted 3 from 8 instead of 8 from 3 $k = -5$								
3	a) $d = 8$ b) $x = -6$ c) $m = -8$ d) $n = 3.4$								
4	a) Yes. The number of counters in the cups is $4x$, so 2 more than $4x$ is 14 b) $4x + 2 = 14$ $4x = 12$ $x = 3$ c) 3								
5	a) He can use two negative counters and two positive counters to create two zero pairs and then the equation will be a one-step equation which Dexter already knows how to solve. b) $4x - 2 = 14$ $4x = 16$ $x = 4$ c) 4								
6	a) $x = 3$ b) $x = 1$ c) $x = 6$ d) $y = 4$ e) $n = -2$ f) $k = 5$								
7	$p = 35$								
8	<table border="1" style="margin-left: 20px;"> <tr> <td style="width: 20px;">y</td> <td style="width: 20px;">y</td> <td style="width: 20px;">y</td> <td style="width: 100px;">75</td> </tr> <tr> <td colspan="4" style="text-align: center;">102</td> </tr> </table> $y = 9$	y	y	y	75	102			
y	y	y	75						
102									
9	a) In the second line, Scott has subtracted 2 from 11 instead of adding it. b) No. The answer can be written as a fraction: $k = \frac{13}{3}$								

Question	Answer
10	a) $w = \frac{17}{8}$ b) $g = \frac{13}{5}$ c) $p = -\frac{4}{5}$ d) $g = \frac{7}{6}$

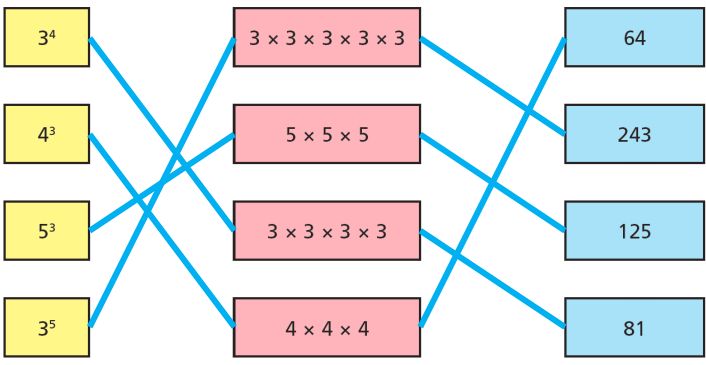
Y7 - Spring - Block 4 - Step 11 - Solve two-step equations Answers

Question	Answer
1	a) $y = 4$ b) $y = -2$ Students need to justify which bar model they prefer.
2	He has subtracted 5 from 9 instead of 9 from 5 $2n + 9 = 5$ $2n = 5 - 9 = -4$ $n = -2$
3	a) $a = -3$ b) $c = -5$ c) $y = -2$ d) $b = -1$ e) $d = -4$ f) $h = -8.5$
4	a) $y = 5$ b) $y = -1$ c) $y = 5$ d) $y = 1$ Parts a) and c) have the same answer as they can be made into the same equation.
5	a) $m = 6$ b) $g = -3$ c) $k = 1.2$ d) $p = -1.5$
6	a) $g = 10$ b) $g = -10$ c) $g = -10$ d) $g = 38$ e) $g = 38$ f) $g = 10$
7	a) $x = 10$ b) $x = 14$ The equations use the same numbers and operations, but in a different order.
8	multiple possible answers, e.g.: $2x + -13 = 1$ $3x - 20 = 1$ $-2x + 15 = 1$ $-3x - -22 = 1$ In the first equation, for integer values, if the coefficient of x is positive, the number needs to be negative; if the coefficient of x is negative, the number needs to be positive.
9	$p = -3.5$

Question	Answer
1	a) He has added 2 and 5 before multiplying by 4. He should have multiplied 5 by 4 first. b) 22
2	a) 5 b) 10 c) 10 d) 29 e) 52 f) 85 g) 19 h) 9 i) 12 j) 112
3	a) $20 - 8 - 2 \times 5$ $20 - (5 \times 2 + 8)$  $20 - 2 \times 5 + 8$ $20 - 2 \times 5 - 8$ b) multiple possible answers, e.g.: $35 - 9 - 9 - 4$ $35 - 2 \times 9 - 4$ $35 - 4 - 2 \times 9$ $35 - (9 + 9 + 4)$
4	In the second line, she has subtracted 4 from 11 instead of -4 from 11 15 She could use brackets round the negative numbers.
5	a) 31 b) -51 c) 32 d) -6 e) 29 f) -21.5 g) -25 h) -96 i) 18 j) 17
6	a) 7 b) 8 c) 4 or -4 d) multiple possible answers, e.g.: $-3 = 17 - 8 \times 3 + 4$ There are two possible answers for part c) and an infinite number of answers for part d).

Question	Answer
7	<div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="border: 1px solid black; padding: 5px; margin: 5px;">$4 \div 4 - 7 \times 5 = -30$</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">$(4 \div 4) - (7 \times 5) = -30$</div> </div> <div style="display: flex; justify-content: space-around; align-items: flex-start; margin-top: 10px;"> <div style="border: 1px solid black; padding: 5px; margin: 5px;">$4 \div (4 - 7) \times 5 = -30$</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">$(4 \div 4 - 7) \times 5 = -30$ ✓</div> </div>
8	<p>a) 6 b) 35</p>
9	<p>a) $5 - (20 + 2) \div 11 = 3$ b) $21 = 5 + 4 \times (15 - 11)$</p>
10	<p>multiple possible answers, e.g.:</p> <p>a) $5 \times 3 - 2$ $5 \times 2 + 3$ $5 \times (4 - 2) + 3$ $5 \times 4 \div 2 + 3$</p> <p>b) $2 - 3$ $3 - 4$ $4 - 5$ $5 - 2 \times 3$</p> <p>c) $-(4 + 5)$ $3 \times (2 - 5)$ $2 + 4 - 5 \times 3$</p> <p>d) $5 + 3 - 4 \times 2$ $5 - (3 + 4 \div 2)$</p> <p>All the numbers can be made in more than one way.</p>

Question	Answer									
1	a) 16 16 -16 b) 49 -49 49 c) 0									
2	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;"></th> <th style="width: 35%;">Square number</th> <th style="width: 35%;">Not a square number</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">Positive number</td> <td style="text-align: center;">4 169 49</td> <td style="text-align: center;">71 10 2 200</td> </tr> <tr> <td style="text-align: center;">Negative number</td> <td></td> <td style="text-align: center;">-8 -16 -25 -81 -50</td> </tr> </tbody> </table> <p>All square numbers are positive. There are no negative square numbers.</p>		Square number	Not a square number	Positive number	4 169 49	71 10 2 200	Negative number		-8 -16 -25 -81 -50
	Square number	Not a square number								
Positive number	4 169 49	71 10 2 200								
Negative number		-8 -16 -25 -81 -50								
3	No. Calculating the square root of a number is not the same as dividing by 2 $\sqrt{64} = 8$									
4	a) $x = 5$ and $x = -5$ b) $x = 1$ and $x = -1$ c) $x = 11$ and $x = -11$ d) $x = 2$ and $x = -2$ e) $x = 3,000$ and $x = -3,000$									
5	$y = 8.66$ and $y = -8.66$ (to 3 s.f.)									
6	a) $-4 \times -4 = 16$, not -16 b) She should have put brackets round -4 in order to calculate $(-4)^2$									
7	$\sqrt{\frac{1}{4}} = \frac{1}{2}$ and $\frac{1}{2} > \frac{1}{4}$									
8	a) 15 or -15 b) There are two possible answers.									
9	multiple possible answers, e.g.: 3 and 4 5 and 12 8 and 15									

Question	Answer												
1													
2	<p>a) 64 b) 36 c) 1 d) 121 e) 125 f) -125 g) 729 h) 10</p>												
3	<p>The cube of 8 = 512 The cube root of 8 = 2 The cube root of -8 = -2</p>												
4	<table border="1"> <thead> <tr> <th>Answer of 16</th> <th>Answer of 64</th> <th>Answer of 81</th> </tr> </thead> <tbody> <tr> <td>4^2</td> <td>4^3</td> <td>9^2</td> </tr> <tr> <td>$(-4)^2$</td> <td>$(-8)^2$</td> <td>3^4</td> </tr> <tr> <td>2^4</td> <td>2^6</td> <td>$(-3)^4$</td> </tr> </tbody> </table>	Answer of 16	Answer of 64	Answer of 81	4^2	4^3	9^2	$(-4)^2$	$(-8)^2$	3^4	2^4	2^6	$(-3)^4$
Answer of 16	Answer of 64	Answer of 81											
4^2	4^3	9^2											
$(-4)^2$	$(-8)^2$	3^4											
2^4	2^6	$(-3)^4$											
5	<p>a) 2 16 4 b) 9^2 3^4 c) 8^2 4^3 2^6 multiple possible answers, e.g.: $4^2 = 2^4 = 16$</p>												

Question	Answer																
6	<table border="1"> <tr> <td>3^0</td> <td>3^1</td> <td>3^2</td> <td>3^3</td> <td>3^4</td> <td>3^5</td> <td>3^6</td> <td>3^7</td> </tr> <tr> <td>1</td> <td>3</td> <td>9</td> <td>27</td> <td>81</td> <td>243</td> <td>729</td> <td>2,187</td> </tr> </table>	3^0	3^1	3^2	3^3	3^4	3^5	3^6	3^7	1	3	9	27	81	243	729	2,187
	3^0	3^1	3^2	3^3	3^4	3^5	3^6	3^7									
	1	3	9	27	81	243	729	2,187									
	<table border="1"> <tr> <td>$(-3)^0$</td> <td>$(-3)^1$</td> <td>$(-3)^2$</td> <td>$(-3)^3$</td> <td>$(-3)^4$</td> <td>$(-3)^5$</td> <td>$(-3)^6$</td> <td>$(-3)^7$</td> </tr> <tr> <td>1</td> <td>-3</td> <td>9</td> <td>-27</td> <td>81</td> <td>-243</td> <td>729</td> <td>-2,187</td> </tr> </table>	$(-3)^0$	$(-3)^1$	$(-3)^2$	$(-3)^3$	$(-3)^4$	$(-3)^5$	$(-3)^6$	$(-3)^7$	1	-3	9	-27	81	-243	729	-2,187
$(-3)^0$	$(-3)^1$	$(-3)^2$	$(-3)^3$	$(-3)^4$	$(-3)^5$	$(-3)^6$	$(-3)^7$										
1	-3	9	-27	81	-243	729	-2,187										
<p>b) The numbers are the same, but in the second table every other value is negative. Even powers of all numbers are positive. Odd powers of negative numbers are negative.</p> <p>c) It is an even power.</p>																	
7	<p> 5^7 $(-4)^7$ $(-5)^4$ $(-6)^3$ $(-3)^6$ $(-11.8)^{15}$ $(-7)^{80}$ 17^{39} </p> <p>The negative answers are all for odd powers of negative numbers.</p>																
8	<p>a) 27 b) 6 or -6 c) 2 d) 5</p> <p>Part b) has two possible answers because it is an even root.</p>																
9	<p>a) -3 b) 19,683 c) 5 or -5 d) 4</p>																
10	<p>multiple possible answers, e.g.:</p> <p>-2 $\frac{1}{2}$</p> <p>The answer can be any negative number or a number less than 1</p>																