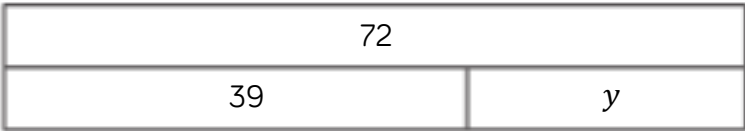
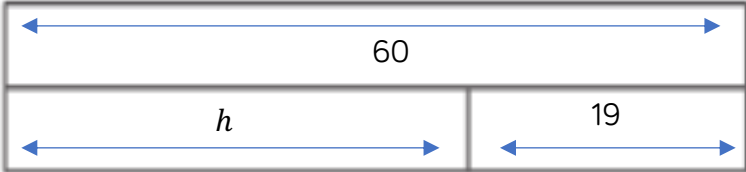
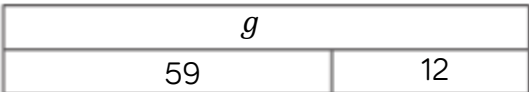


Y7 - Autumn - Block 3 - ANS1 - Understand the meaning of equality

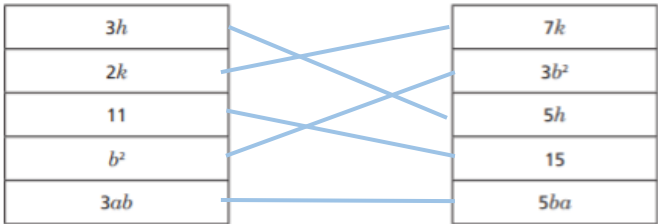
Question	Answer										
1	$7 + 2 = 9$ <input checked="" type="checkbox"/> $10 = 3 + 8$ <input type="checkbox"/> $13 - 6 = 7$ <input checked="" type="checkbox"/> $6 = 25 - 19$ <input checked="" type="checkbox"/> $36 = 5 \times 7$ <input type="checkbox"/> $56 \div 7 = 6$ <input type="checkbox"/>										
2	<p>Students should notice that there are multiple possible answers for each part.</p> $9 + 8 = 6 + 12$ <input type="checkbox"/> $17 + 4 = 3 \times 7$ <input checked="" type="checkbox"/> $6 \times 3 = 5 \times 4$ <input type="checkbox"/> $55 \div 11 = 2 + 3$ <input checked="" type="checkbox"/> $7 \times 9 = 70 - 7$ <input checked="" type="checkbox"/> $76 - 19 = 49 + 9$ <input type="checkbox"/> $19 + 87 = 87 - 1 + 20$ <input checked="" type="checkbox"/> $109 + 30 - 1 = 110 + 29$ <input type="checkbox"/> $423 - 99 = 423 + 1 - 100$ <input checked="" type="checkbox"/> $23 \times 99 = 2,300 - 23$ <input checked="" type="checkbox"/> $7,878 - 78 = 99 \times 78$ <input type="checkbox"/> $6,823 \times 999 = 6,823,000 - 6,823$ <input checked="" type="checkbox"/>										
3	<table border="1" style="width: 100%; text-align: center;"> <tr> <td colspan="2">80</td> </tr> <tr> <td>50</td> <td>30</td> </tr> </table>	80		50	30						
80											
50	30										
4	<p>E.g. $3 \times 5 = 9 + 4 + 2$ $3 \times 10 = 25 + 5$</p>										
5	<table style="width: 100%;"> <tr> <td style="width: 50%;">a) 10</td> <td style="width: 50%;">f) 4</td> </tr> <tr> <td>b) 4</td> <td>g) 0.1</td> </tr> <tr> <td>c) 59</td> <td>h) 1</td> </tr> <tr> <td>d) 2</td> <td>i) 80</td> </tr> <tr> <td>e) 9</td> <td></td> </tr> </table>	a) 10	f) 4	b) 4	g) 0.1	c) 59	h) 1	d) 2	i) 80	e) 9	
a) 10	f) 4										
b) 4	g) 0.1										
c) 59	h) 1										
d) 2	i) 80										
e) 9											
6	<p>E.g.</p> <p>a) $6 + 5 = 7 + 4$ b) $6 \times 8 = 55 - 7$ c) $8 \times 7 = 64 - 8$</p>										
7	<p>Yes</p> $4,891 + 325 = 4,891 + 325 + 1 - 1 = 4,891 - 1 + 325 + 1 = 4,890 + 326$										
8	<p>a) 339 b) 792 c) 2,373 d) 237</p>										
9	<p>a) 40 ($20 \times 10 = 200$, $4 \times 10 = 40$) b) 700 ($70 \times 5 = (70 \times 10) \div 2$) c) 0.012 ($4,800 \div 1000 = 4.8$, $12 \div 1000 = 0.012$)</p>										

Question	Answer
1	$3 + 5 = 8$, $8 = 3 + 5$, $8 = 5 + 3$ $8 - 5 = 3$, $3 = 8 - 5$, $5 = 8 - 3$
2	a) $\frac{8+9=17}{9+8=17}$ $\frac{17=8+9}{17=9+8}$ $\frac{17-9=8}{17-8=9}$ $\frac{8=17-9}{9=17-8}$ b) $\frac{18+5=23}{5+18=23}$ $\frac{23=18+5}{23=5+18}$ $\frac{23-5=18}{23-18=5}$ $\frac{18=23-5}{5=23-18}$
3	a) Annie is incorrect because 31 is the total of 19 and y ($19 + y = 31$) $\frac{19+y=31}{31-y=19}$ $\frac{31=19+y}{19=31-y}$ b) $\frac{y+19=31}{31-19=y}$ $\frac{31=y+19}{y=31-19}$
4	a) $\frac{14+19=h}{19+14=h}$ $\frac{h=14+19}{h=19+14}$ $\frac{h-19=14}{h-14=19}$ $\frac{14=h-19}{19=h-14}$ b) $\frac{y+34=52}{34+y=52}$ $\frac{52=y+34}{52=34+y}$ $\frac{52-y=34}{52-34=y}$ $\frac{34=52-y}{y=52-34}$
5	a) $k + 8 = m$, $8 + k = m$, $m - k = 8$, $m - 8 = k$ b) $n + p = 50$, $p + n = 50$, $50 - n = p$, $50 - p = n$
6	a) $15 = 3 \times 5$ $15 = 5 \times 3$ $15 \div 3 = 5$ $15 \div 5 = 3$ b) $30 = 6 \times y$ $30 = y \times 6$ $30 \div y = 6$ $30 \div 6 = y$ c) $0.3 \times 10 = p$ $p \times 0.3 = 10$ $p \div 0.3 = 10$ $p \div 10 = 0.3$

Question	Answer																												
7	<p>a) <table border="1"><tr><td colspan="2">82.3</td></tr><tr><td>51.6</td><td>30.7</td></tr></table></p> <p>b) <table border="1"><tr><td colspan="2">152</td></tr><tr><td>9</td><td>98</td></tr></table></p> <p>c) <table border="1"><tr><td colspan="4">k</td></tr><tr><td>23</td><td>23</td><td>23</td><td>23</td></tr></table></p> <p>d) <table border="1"><tr><td colspan="6">108</td></tr><tr><td>w</td><td>w</td><td>w</td><td>w</td><td>w</td><td>w</td></tr></table></p> <p>Students should use their knowledge of fact families to see what other calculations can be seen from the bar models.</p>	82.3		51.6	30.7	152		9	98	k				23	23	23	23	108						w	w	w	w	w	w
82.3																													
51.6	30.7																												
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9	98																												
k																													
23	23	23	23																										
108																													
w	w	w	w	w	w																								

Question	Answer
1	a) $w + 78 = 163$ b) $78 + w = 163$ $w = 163 - 78$ ✓ $78 = 163 - w$ c) $w = 85$
2	a) $128 + x = 205$ $x + 128 = 205$ $205 - x = 128$ $205 - 128 = x$ b) $x = 77$
3	a)  b) $y + 39 = 72$, $39 + y = 72$, $72 - y = 39$, $72 - 39 = y$ c) $y = 33$
4	a) $d = 32$ b) $e = 13.2$ c) $f = 46.1$ d) $x = 302.53$ e) $y = 1,998.45$
5	
6	a)  $59 + 12 = g$, $12 + 59 = g$, $g - 59 = 12$, $g - 12 = 59$ b) $g = 71$
7	a) $b = 52$ b) $m = 247$ c) $p = 728.3$
8	$x + 87 = 153$ $302.1 - x = 149.8$ Whitney's number is 66. Tommy's number is 152.3

Question	Answer										
1	a) b) $b \times \boxed{3} = 51$ $3 \times \boxed{b} = 51$ $51 \div \boxed{b} = 3$ $51 \div \boxed{3} = b$ ✓ c) $b = 17$										
2	a) $a \times 4 = 30$, $4 \times a = 30$, $30 \div 4 = a$, $30 \div a = 4$ b) $a = 7.5$										
3	a) <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td colspan="5" style="text-align: center;">105</td> </tr> <tr> <td style="text-align: center;">c</td> <td style="text-align: center;">c</td> <td style="text-align: center;">c</td> <td style="text-align: center;">c</td> <td style="text-align: center;">c</td> </tr> </table> b) $5 \times c = 105$, $105 \div 5 = c$, $c \times 5 = 105$, $105 \div c = 5$ c) $c = 15$	105					c	c	c	c	c
105											
c	c	c	c	c							
4	Mo is wrong because $10 \times 5 \neq 2$ The correct value of $a = 0.2$										
5	a) $g = 6$ b) $h = 37.2$ c) $k = 3.3$ d) $p = \frac{3}{10}$										
6	a) Teddy is incorrect because $1,412 \times 4 > 4,000$ b) $a = 956$										
7	<table style="margin-left: auto; margin-right: auto;"> <tr> <td style="border: 1px solid black; background-color: yellow; padding: 5px;">e</td> </tr> <tr> <td style="border: 1px solid black; background-color: lightblue; padding: 5px;">7</td> <td style="border: 1px solid black; background-color: lightblue; padding: 5px;">7</td> <td style="border: 1px solid black; background-color: lightblue; padding: 5px;">7</td> <td style="border: 1px solid black; background-color: lightblue; padding: 5px;">7</td> </tr> </table> $\frac{e}{4} = 7$ $4 \times 7 = e$	e	7	7	7	7					
e											
7	7	7	7								
8	Amir is correct because $90 \div 3 = 30$										
9	a) $n = 48$ b) $m = 150$ c) $p = 3$ d) $y = 30$										
10	They contain the same numbers, letter and operation, but the operation is applied differently. In the first one n is divided by 10 to give 5, whereas in the second on 10 is divided by n to give 5.										

Question	Answer
1	
2	<p>a) Like b) Unlike c) Unlike d) Like e) Unlike f) Unlike g) Like</p>
3	<p>a) $3x$ $4y$ $2xy$ $5yx$</p> <p>b) $5h$ $3h^2$ h^3 $-5h^2$</p> <p>c) $5p$ $\frac{1}{2}p$ 11 $0.957p$</p>
4	<p>She hasn't looked at the powers.</p>
5	<p>a) e.g. $2c$, $-9c$, $107c$, $\frac{1}{2}c$, $0.75c$</p> <p>b) e.g. $16g$, $3g$, $-100g$, $\frac{g}{2}$, $0.4g$</p> <p>c) e.g. a^2 , $-a^2$, $7a^2$, $0.97a^2$, $1000a^2$</p> <p>Students should discuss that the letter and its power is important, but it's coefficient is not.</p>
6	<p>Like terms - same variable and same powers Unlike terms - either not the same variable or not the same powers.</p>
7	<p>y , $5y$, $15y$, $-5y$ 5 , 15 , -5 , -15 y^2 , $5y^2$, $-5y^2$ p , $-5p$, $15p$</p>
8	<p>a) Yes because they have the same variables (p and r) and the same powers (p and r^2) b) Yes because they are all numbers (no variables)</p>

Question	Answer																											
1	<p>a)</p> <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Expression</th> <th>Value when $y = 5$</th> <th>Value when $y = 9$</th> </tr> </thead> <tbody> <tr><td>$7y$</td><td>35</td><td>63</td></tr> <tr><td>$3y$</td><td>15</td><td>27</td></tr> <tr><td>$4y + 3y$</td><td>35</td><td>63</td></tr> <tr><td>$10 - 3y$</td><td>-5</td><td>-17</td></tr> <tr><td>$7y - 4y$</td><td>15</td><td>27</td></tr> <tr><td>$y + y + y$</td><td>15</td><td>27</td></tr> <tr><td>$3y + 4$</td><td>19</td><td>31</td></tr> <tr><td>$4y - y$</td><td>15</td><td>27</td></tr> </tbody> </table> <p>b) $7y$, $4y + 3y$ $3y$, $7y - 4y$, $y + y + y$, $4y - y$</p> <p>c) $7y \equiv 4y + 3y$ $3y \equiv 7y - 4y \equiv y + y + y \equiv 4y - y$</p>	Expression	Value when $y = 5$	Value when $y = 9$	$7y$	35	63	$3y$	15	27	$4y + 3y$	35	63	$10 - 3y$	-5	-17	$7y - 4y$	15	27	$y + y + y$	15	27	$3y + 4$	19	31	$4y - y$	15	27
Expression	Value when $y = 5$	Value when $y = 9$																										
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$4y - y$	15	27																										
2	<table style="width: 100%; text-align: center;"> <tr> <td>$p + 7p$ ✓</td> <td>$\frac{p}{8}$</td> <td>$8p - p - 7p$</td> </tr> <tr> <td>$11p - 3$</td> <td>$4p \times 2$ ✓</td> <td>$11p - 3p$ ✓</td> </tr> <tr> <td>$2p \times 4p$</td> <td>$4 \times 2p$ ✓</td> <td>$3p - 11p$</td> </tr> </table>	$p + 7p$ ✓	$\frac{p}{8}$	$8p - p - 7p$	$11p - 3$	$4p \times 2$ ✓	$11p - 3p$ ✓	$2p \times 4p$	$4 \times 2p$ ✓	$3p - 11p$																		
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3	<p>a)</p> <table border="1" style="margin-left: 20px;"> <tbody> <tr> <td>$3m + 7m$</td> <td>$5m + 5m$</td> <td>$5m \times 2$</td> </tr> <tr> <td>$4m + 6m$</td> <td style="background-color: #e0f0ff;">$10m$</td> <td>$3m + 3m + 4m$</td> </tr> <tr> <td>$50m \div 5$</td> <td>$16m - 6m$</td> <td>$12m - 2m$</td> </tr> </tbody> </table> <p>b) E.g. $24a \times b$, $20ab + 4ab$ $8a \times 3b$, $30ab - 6ab$ $6ab \times 4$</p>	$3m + 7m$	$5m + 5m$	$5m \times 2$	$4m + 6m$	$10m$	$3m + 3m + 4m$	$50m \div 5$	$16m - 6m$	$12m - 2m$																		
$3m + 7m$	$5m + 5m$	$5m \times 2$																										
$4m + 6m$	$10m$	$3m + 3m + 4m$																										
$50m \div 5$	$16m - 6m$	$12m - 2m$																										
4	$4g + 20 \equiv 4(g + 5)$																											
5	<p>a)</p> <p style="text-align: center;"> $6 + 3x$ $3(x + 2)$ $3(x + 6)$ </p> <p>b)</p> <p style="text-align: center;"> $20 - 8y$ $4y + 4y - 20$ $2(4y - 10)$ </p> <p>Students should compare their methods.</p>																											
6	<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 60%;"></th> <th style="width: 10%; text-align: center;">True</th> <th style="width: 10%; text-align: center;">False</th> </tr> </thead> <tbody> <tr> <td>$2x + 3x$ is equivalent to $5x$</td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td>$2x \times 3x$ is equivalent to $5x$</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> <tr> <td>$7x - 2x$ is equivalent to $5x$</td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td>$7x - 2x$ is equivalent to 5</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> </tbody> </table> <p>Students should compare their answers and reasoning with a partner.</p>		True	False	$2x + 3x$ is equivalent to $5x$	<input checked="" type="checkbox"/>	<input type="checkbox"/>	$2x \times 3x$ is equivalent to $5x$	<input type="checkbox"/>	<input checked="" type="checkbox"/>	$7x - 2x$ is equivalent to $5x$	<input checked="" type="checkbox"/>	<input type="checkbox"/>	$7x - 2x$ is equivalent to 5	<input type="checkbox"/>	<input checked="" type="checkbox"/>												
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Y7 - Autumn - Block 3 - ANS6 - Understand the meaning of equivalence

Question	Answer
7	No because they have different powers.
8	2
9	<p>$5ab$ and $5ba$ $5(a + b)$ and $5a + b$ $3a + 2b$ and $5ab$ $\frac{m}{2}$ and $\frac{2}{m}$</p> <p>$5ab$ and $5ba$ are equal for any values of a and b as both expressions are the product of 5, a and b. ab and ba are like terms.</p> <p>The others are only equal for certain values and students should work together to identify some of these values.</p>

Y7 - Autumn - Block 3 - ANS7 - Simplify algebraic expressions by collecting like terms, using the \equiv symbol

Question	Answer																					
1																						
2	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: #add8e6;"> <th>Expression</th> <th>Mo's answer</th> <th>Eva's answer</th> </tr> </thead> <tbody> <tr> <td>$9a - a$</td> <td>$9a - a \equiv 9$</td> <td>$9a - a \equiv 8a$ ✓</td> </tr> <tr> <td>$b + b$</td> <td>$b + b \equiv b^2$</td> <td>$b + b \equiv 2b$ ✓</td> </tr> <tr> <td>$3h^3 + 2h^2$</td> <td>$3h^3 + 2h^2 \equiv 5h^2$</td> <td>$3h^3 + 2h^2 \equiv 5h^5$</td> </tr> <tr> <td>$3a + 3b$</td> <td>$3a + 3b \equiv 6ab$</td> <td>$3a + 3b \equiv 3a + 3b$ ✓</td> </tr> <tr> <td>$5g + 2$</td> <td>$5g + 2 \equiv 5g + 2$ ✓</td> <td>$5g + 2 \equiv 7g$</td> </tr> <tr> <td>$6 \times 2y$</td> <td>$6 \times 2y \equiv 12y$ ✓</td> <td>$6 \times 2y \equiv 8y$</td> </tr> </tbody> </table>	Expression	Mo's answer	Eva's answer	$9a - a$	$9a - a \equiv 9$	$9a - a \equiv 8a$ ✓	$b + b$	$b + b \equiv b^2$	$b + b \equiv 2b$ ✓	$3h^3 + 2h^2$	$3h^3 + 2h^2 \equiv 5h^2$	$3h^3 + 2h^2 \equiv 5h^5$	$3a + 3b$	$3a + 3b \equiv 6ab$	$3a + 3b \equiv 3a + 3b$ ✓	$5g + 2$	$5g + 2 \equiv 5g + 2$ ✓	$5g + 2 \equiv 7g$	$6 \times 2y$	$6 \times 2y \equiv 12y$ ✓	$6 \times 2y \equiv 8y$
Expression	Mo's answer	Eva's answer																				
$9a - a$	$9a - a \equiv 9$	$9a - a \equiv 8a$ ✓																				
$b + b$	$b + b \equiv b^2$	$b + b \equiv 2b$ ✓																				
$3h^3 + 2h^2$	$3h^3 + 2h^2 \equiv 5h^2$	$3h^3 + 2h^2 \equiv 5h^5$																				
$3a + 3b$	$3a + 3b \equiv 6ab$	$3a + 3b \equiv 3a + 3b$ ✓																				
$5g + 2$	$5g + 2 \equiv 5g + 2$ ✓	$5g + 2 \equiv 7g$																				
$6 \times 2y$	$6 \times 2y \equiv 12y$ ✓	$6 \times 2y \equiv 8y$																				
3	<p>a) $5h$, $5h$ $5h$, $5h$</p> <p>b) Each of the answers in part a) are $5h$ as all of the expressions are equivalent.</p> <p>c) <i>E.g.</i></p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="border-bottom: 1px solid black;">$g + g + g \equiv 3g$</td> <td style="border-bottom: 1px solid black;">$10g - 7g \equiv 3g$</td> </tr> <tr> <td style="border-bottom: 1px solid black;">$2g + g \equiv 3g$</td> <td style="border-bottom: 1px solid black;">$99g - 96g \equiv 3g$</td> </tr> <tr> <td style="border-bottom: 1px solid black;">$4g - g \equiv 3g$</td> <td></td> </tr> </table>	$g + g + g \equiv 3g$	$10g - 7g \equiv 3g$	$2g + g \equiv 3g$	$99g - 96g \equiv 3g$	$4g - g \equiv 3g$																
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<p>a) $4p$</p> <p>b) $12f$</p> <p>c) $3g$</p> <p>d) $18h$</p> <p>e) $8n$</p> <p>f) $14y$</p>	<p>g) $-4n$</p> <p>h) $21y^2$</p> <p>i) $2ef$</p> <p>j) $1.15m$</p> <p>k) $2p$</p>																					
5	<p>a) $3a$ and $2m$ are not like terms.</p> <p>b) $2b$ and 3 are not like terms so you cannot collect them.</p> <p>c) You can simplify the like terms ($7k$, $-3k$ and $2k$) so $7k, -3k + 2k + 3a \equiv 6k + 3a$</p>																					
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Y7 – Autumn – Block 3 – ANS7 – Simplify algebraic expressions by collecting like terms, using the \equiv symbol

Question	Answer										
7	Yes. pq and qp are like terms as they are both product of p and q . $3pq + 5qp \equiv 3pq + 5pq \equiv 8pq$										
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