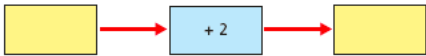
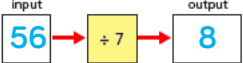
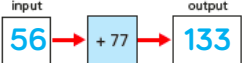

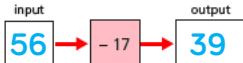
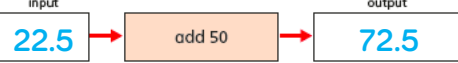
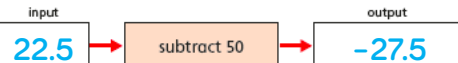
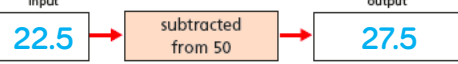
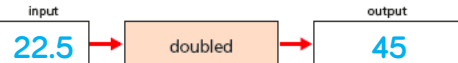




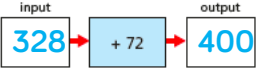
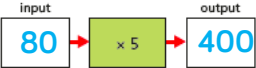
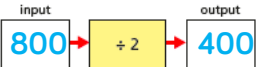
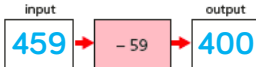
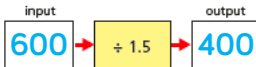
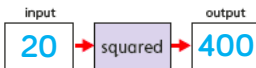
Y7 – Autumn – Block 2 – Step 1 – Single function machines (number) Answers

Question	Answer
1	<p style="text-align: center;">input output</p> 
2	<p>a) 5 b) 2 c) 15 d) 50</p>
3	<p>a) </p> <p>b) </p> <p>c) </p> <p>d) </p>
4	Tommy has doubled 8 instead of squaring it.
5	<p>a) </p> <p>b) </p> <p>c) </p> <p>d) </p> <p>e) </p> <p>f) </p>

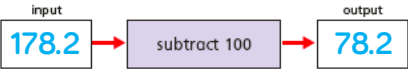
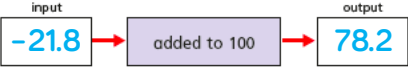
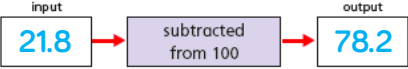








Y7 – Autumn – Block 2 – Step 1 – Single function machines (number) Answers (continued)





Question	Answer
6	<p>input 3,198 → + 16,000 → output 19,198 <input type="checkbox"/></p> <p>input 14 → × 987 → output 13,818 <input type="checkbox"/></p> <p>input 101 → squared → output 10,201 <input type="checkbox"/></p> <p>input 99,999 → ÷ 5 → output 19,999.8 <input checked="" type="checkbox"/></p>
7	<p>a) multiple possible answers, e.g. 1 b) multiple possible answers, e.g. 2,000 c) $\frac{18,000}{7}$</p>
8	<p>Dora is correct because all the operations are equivalent.</p>
9	<p>a) possible answers: ÷ 8, $\times \frac{1}{8}$, $\times 0.125$, + 56, squared b) multiple possible answers, e.g.: input 2, output 8, operations $\times 4$, $\div \frac{1}{4}$, cubed</p>

Y7 – Autumn – Block 2 – Step 2 – Find the input given the output Answers

Question	Answer
1	The inverse of addition is subtraction . The inverse of division is multiplication . The inverse of squaring is square root .
2	a) 10 b) 30 c) 2 d) 200 inverse operation
3	Annie has squared the output instead of using the inverse operation of square root.
4	a) 93 b) 324 c) 17 d) 6 e) 28.8 f) 4.5
5	a)  b)  c)  d)  e)  f) 

Y7 – Autumn – Block 2 – Step 2 – Find the input given the output Answers (continued)



Question	Answer
6	<p>a) </p> <p>b) </p> <p>c) </p>
7	<p>a) 29 b) 1 c) 5.5 d) 100</p>
8	<p>a) 4 b) 12 c) $\frac{1}{4}$ d) - 12</p>
9	<p>multiple possible answers, e.g.:</p> <p>a)  </p> <p>b)  </p> <p>c)  </p> <p>d)  </p>

Question	Answer
1	<p>a) $5 + 5 + 5 = 3 \times 5 = 5 \times 3$</p> <p>b) $7 + 7 + 7 + 7 = 4 \times 7 = 7 \times 4$</p> <p>c)  $= 4 \times 4 = 4 \times 4$</p> <p>d) $9 + 9 + 9 + 9 + 9 = 5 \times 9 = 9 \times 5$</p> <p>e) $c + c + c + c + c = 5 \times c = c \times 5$</p> <p>f) $d + d + d + d = 4 \times d = d \times 4$</p>
2	<div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;">  <input type="checkbox"/> </div> <div style="text-align: center;">  <input type="checkbox"/> </div> <div style="text-align: center;">  <input checked="" type="checkbox"/> </div> </div> <p>The other bar models represent: $m + 4$ (4 more than m) $4 + m$ (m more than 4)</p>
3	<p>$a + a = a^2$ $a + a = 2a$ $a + a = a2$</p> <p>multiple possible answers, e.g.:</p> <div style="border: 1px solid blue; padding: 2px; display: inline-block;"> a a </div> <p>$a + a = 2a$ a means the same, so is equivalent, but is not the proper way of writing 2 lots of a</p>
4	<p>a) The bar model shows 3 lots of $2b$.</p> <p>b) $2b \times 3 = 2b + 2b + 2b = 6b$</p>
5	<p>a) $3g$</p> <p>b) $3g$</p> <p>c) $\frac{h}{3}$</p> <p>d) $\frac{3}{h}$</p> <p>e) $7y$</p> <p>f) jk</p> <p>g) k^2</p> <p>h) $10d$</p> <p>i) $21a$</p> <p>j) $20c$</p> <p>k) $5a^2$</p> <p>l) $12r$</p>


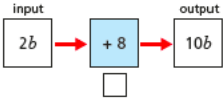


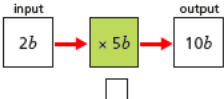
Y7 – Autumn – Block 2 – Step 3 – Use letters to generalise number Answers (continued)

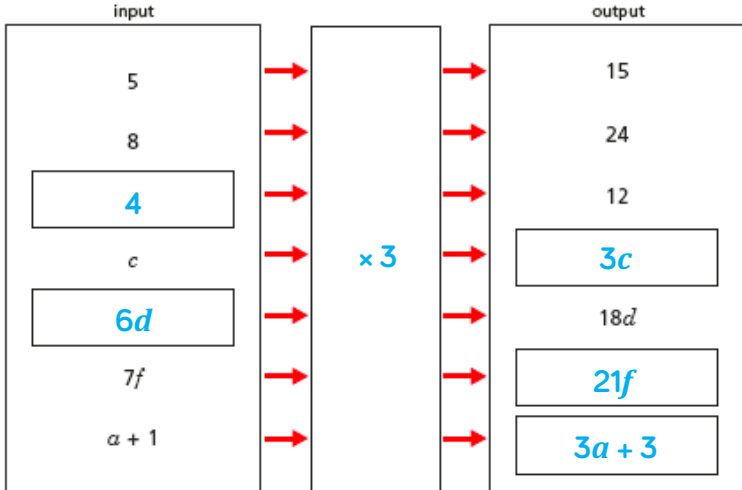
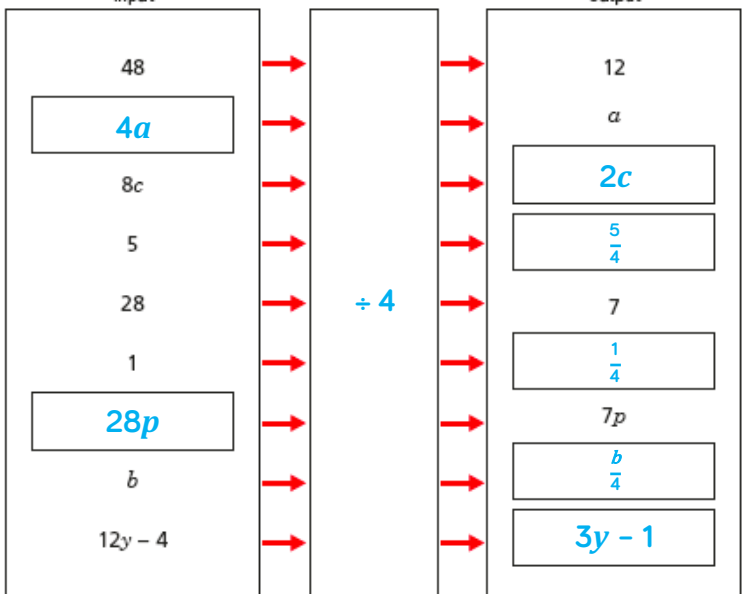
Question	Answer
6	a) $2 \times m$ b) $m \div 2$ c) m squared d) $2 \div m$ e) $g \times h$ f) $h \div g$
7	a) $\frac{m}{7}$ b) $3r$ c) $11p$ d) t^2 e) $\frac{k}{n}$ f) $3py$
8	In multiplication, the order of the terms does not matter. Multiplication is commutative. No, in division the order of the terms does matter. Division is not commutative.

Y7 - Autumn - Block 2 - Step 4 - Single function machines (algebra) Answers

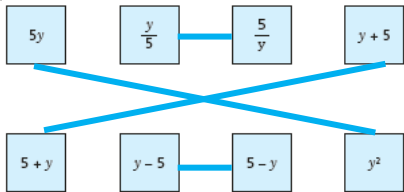
Question	Answer																																																																																																
1	a) $4g$ b) $g + 4$ c) $4c$ d) $c + 4$ e) $12n$ f) $3n + 4$																																																																																																
2	a)  b)  c) a d) $2a$ e) $50c$ f) $\frac{d}{2}$																																																																																																
3	a) Worked out $2 + 3$ instead of 2×3 $6b$ b) Taken the 5 from $5y$ $5y - 5$ c) Added 4 to the 3 in $3a$ $3a + 4$ d) Only $4a$ has been divided by 2 $2a + 1$																																																																																																
4	a) $f - 7$ b) $4h - 4$ c) $r + 6$ d) $6r + 2$																																																																																																
5	a) <table border="0" style="margin-left: 20px;"> <tr> <td style="text-align: right;">input</td> <td style="text-align: center;">→</td> <td style="border: 1px solid black; padding: 5px; width: 40px; text-align: center;">5</td> <td style="text-align: center;">→</td> <td style="border: 10px solid green; padding: 10px; text-align: center; width: 60px; vertical-align: middle;">$\times 4$</td> <td style="text-align: center;">→</td> <td style="border: 1px solid black; padding: 5px; width: 40px; text-align: center;">20</td> <td style="text-align: left;">output</td> </tr> <tr> <td></td> <td style="text-align: center;">→</td> <td style="border: 1px solid black; padding: 5px; width: 40px; text-align: center;">$5b$</td> <td style="text-align: center;">→</td> <td></td> <td style="text-align: center;">→</td> <td style="border: 1px solid black; padding: 5px; width: 40px; text-align: center;">$20b$</td> <td></td> </tr> <tr> <td></td> <td style="text-align: center;">→</td> <td style="border: 1px solid black; padding: 5px; width: 40px; text-align: center;">$b + 2$</td> <td style="text-align: center;">→</td> <td></td> <td style="text-align: center;">→</td> <td style="border: 1px solid black; padding: 5px; width: 40px; text-align: center;">$4b + 8$</td> <td></td> </tr> <tr> <td></td> <td style="text-align: center;">→</td> <td style="border: 1px solid black; padding: 5px; width: 40px; text-align: center;">$5b + 2$</td> <td style="text-align: center;">→</td> <td></td> <td style="text-align: center;">→</td> <td style="border: 1px solid black; padding: 5px; width: 40px; text-align: center;">$20b + 8$</td> <td></td> </tr> </table> b) <table border="0" style="margin-left: 20px;"> <tr> <td style="text-align: right;">input</td> <td style="text-align: center;">→</td> <td style="border: 1px solid black; padding: 5px; width: 40px; text-align: center;">3</td> <td style="text-align: center;">→</td> <td style="border: 10px solid lightblue; padding: 10px; text-align: center; width: 60px; vertical-align: middle;">$+ 6$</td> <td style="text-align: center;">→</td> <td style="border: 1px solid black; padding: 5px; width: 40px; text-align: center;">9</td> <td style="text-align: left;">output</td> </tr> <tr> <td></td> <td style="text-align: center;">→</td> <td style="border: 1px solid black; padding: 5px; width: 40px; text-align: center;">a</td> <td style="text-align: center;">→</td> <td></td> <td style="text-align: center;">→</td> <td style="border: 1px solid black; padding: 5px; width: 40px; text-align: center;">$a + 6$</td> <td></td> </tr> <tr> <td></td> <td style="text-align: center;">→</td> <td style="border: 1px solid black; padding: 5px; width: 40px; text-align: center;">$2a$</td> <td style="text-align: center;">→</td> <td></td> <td style="text-align: center;">→</td> <td style="border: 1px solid black; padding: 5px; width: 40px; text-align: center;">$2a + 6$</td> <td></td> </tr> <tr> <td></td> <td style="text-align: center;">→</td> <td style="border: 1px solid black; padding: 5px; width: 40px; text-align: center;">$2a + 5$</td> <td style="text-align: center;">→</td> <td></td> <td style="text-align: center;">→</td> <td style="border: 1px solid black; padding: 5px; width: 40px; text-align: center;">$2a + 11$</td> <td></td> </tr> </table> c) <table border="0" style="margin-left: 20px;"> <tr> <td style="text-align: right;">input</td> <td style="text-align: center;">→</td> <td style="border: 1px solid black; padding: 5px; width: 40px; text-align: center;">10</td> <td style="text-align: center;">→</td> <td style="border: 10px solid yellow; padding: 10px; text-align: center; width: 60px; vertical-align: middle;">$\div 2$</td> <td style="text-align: center;">→</td> <td style="border: 1px solid black; padding: 5px; width: 40px; text-align: center;">5</td> <td style="text-align: left;">output</td> </tr> <tr> <td></td> <td style="text-align: center;">→</td> <td style="border: 1px solid black; padding: 5px; width: 40px; text-align: center;">$6a$</td> <td style="text-align: center;">→</td> <td></td> <td style="text-align: center;">→</td> <td style="border: 1px solid black; padding: 5px; width: 40px; text-align: center;">$3a$</td> <td></td> </tr> <tr> <td></td> <td style="text-align: center;">→</td> <td style="border: 1px solid black; padding: 5px; width: 40px; text-align: center;">$15a$</td> <td style="text-align: center;">→</td> <td></td> <td style="text-align: center;">→</td> <td style="border: 1px solid black; padding: 5px; width: 40px; text-align: center;">$\frac{15a}{2}$</td> <td></td> </tr> <tr> <td></td> <td style="text-align: center;">→</td> <td style="border: 1px solid black; padding: 5px; width: 40px; text-align: center;">$6a + 10$</td> <td style="text-align: center;">→</td> <td></td> <td style="text-align: center;">→</td> <td style="border: 1px solid black; padding: 5px; width: 40px; text-align: center;">$3a + 5$</td> <td></td> </tr> </table>	input	→	5	→	$\times 4$	→	20	output		→	$5b$	→		→	$20b$			→	$b + 2$	→		→	$4b + 8$			→	$5b + 2$	→		→	$20b + 8$		input	→	3	→	$+ 6$	→	9	output		→	a	→		→	$a + 6$			→	$2a$	→		→	$2a + 6$			→	$2a + 5$	→		→	$2a + 11$		input	→	10	→	$\div 2$	→	5	output		→	$6a$	→		→	$3a$			→	$15a$	→		→	$\frac{15a}{2}$			→	$6a + 10$	→		→	$3a + 5$	
input	→	5	→	$\times 4$	→	20	output																																																																																										
	→	$5b$	→		→	$20b$																																																																																											
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	→	$15a$	→		→	$\frac{15a}{2}$																																																																																											
	→	$6a + 10$	→		→	$3a + 5$																																																																																											

Question	Answer
6	<p>a)</p> <p>input a → $\times 3$ → output $3a$</p> <p>input $3a$ → $+ 3$ → output $3a + 3$</p> <p>input $9a$ → $\div 3$ → output $3a$</p> <p>b)</p> <p>input $\frac{b}{2}$ → $\times 2$ → output b</p> <p>input $b - 2$ → $+ 2$ → output b</p> <p>input $2b$ → $\div 2$ → output b</p> <p>c)</p> <p>input $3c$ → $\times 4$ → output $12c$</p> <p>input $12c + 8$ → $+ 4$ → output $12c + 12$</p> <p>input $48c$ → $\div 4$ → output $12c$</p> <p>d)</p> <p>input $2d - 3$ → $\times 5$ → output $10d - 15$</p> <p>input $d - 3$ → $+ 5$ → output $d + 2$</p> <p>input $100d - 5$ → $\div 5$ → output $20d - 1$</p>
7	<p>multiple possible answers, e.g.:</p> <p>$2g + 1 \rightarrow \times 4 \rightarrow 8g + 4$</p>

Question	Answer
1	a) +5 b) -2 c) $\times 4$ d) +7 e) -5 f) $\div 3$
2	 <p>Both functions involve 3 but the operations are different.</p>
3	<p>a)  </p> <p>The other function machine has added two terms that are not like terms.</p> <p>b)  </p> <p>The other function term has only multiplied the coefficients of b.</p>
4	a) + g b) $\times f$ c) $\times y$ d) $\div 5$ e) $\times r$ f) $\times 2b$ g) $\div r$ h) -5 Part c) could also be 'squared'. Part d) could also be 'square root'.
5	Ron $h + 1 + 4h = 5h + 1$, but $5 \times (h + 1) = 5h + 5$

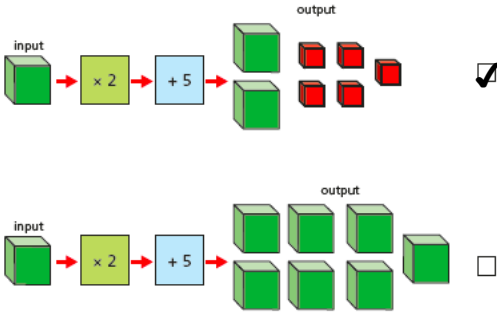
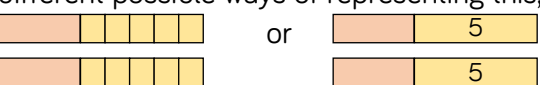

Question	Answer
6	<p>a)</p>  <p>b)</p> 
7	<p>a) $\times 3, + 8c$ b) $\div 5, - 12y$ c) $\div 20, - 28.5h$</p> <p>Other function machines with equivalent operations are possible, e.g. $\div \frac{1}{3}$ instead of $\times 3$</p>

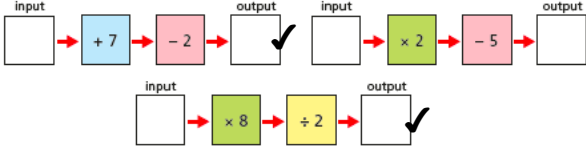
Y7 – Autumn – Block 2 – Step 6 – Substitute into single expressions Answers

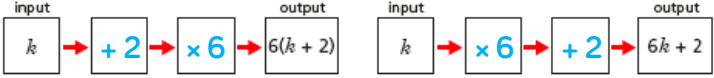

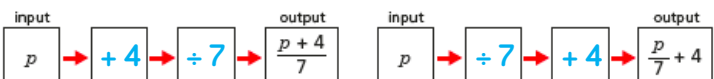
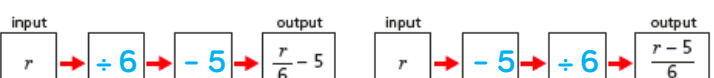
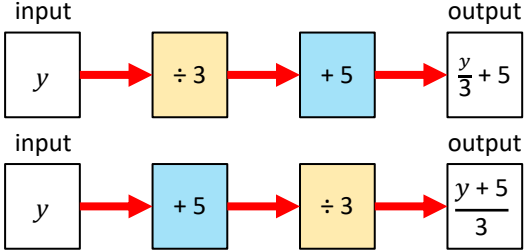
Question	Answer
1	a) 21 b) 10 c) 35 d) 12 e) 34 f) 3.5
2	a) Yes, in addition the order of the terms does not matter. Addition is commutative. b) No, in division the order of the terms does matter. Division is not commutative.
3	Rosie has worked out $12 - 7$. The answer should be -5
4	a) $p + 7 = 23$ $p + 9.5 = 25.5$ $6 + p = 22$ $p + p = 32$ b) $p - 3 = 13$ $p - 20 = -4$ $20 - p = 4$ $p - p = 0$ c) $4p = 64$ $5p = 80$ $3.9p = 62.4$ $p^2 = 256$ d) $\frac{p}{2} = 8$ $\frac{p}{3.2} = 5$ $\frac{40}{p} = 2.5$ $\sqrt{p} = 4$
5	a)  b) $y + 5$ and $5 + y$ c) If $y = 1$, $y - 5 = -4$ and $5 - y = 4$ d) $y + 5$ and $5 + y$

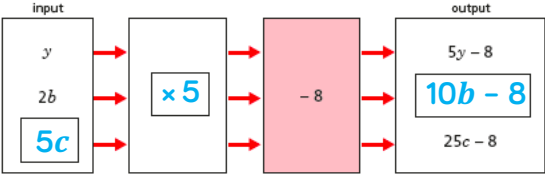
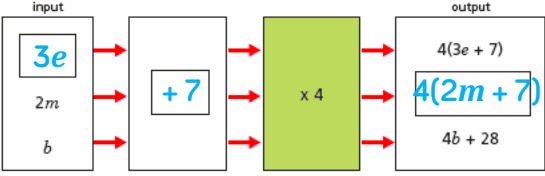
Y7 – Autumn – Block 2 – Step 7 – 2-step function machines (number) Answers

Question	Answer												
1	a) 9 b) 20 c) 5 d) 27												
2	The order of operations is different. If the input was 1, the output on the left would be 10, but the output on the right would be 28												
3	a) 40 b) 33 c) 26 d) 20 e) 1 f) 10 g) 106.2 h) 66.2 i) -5 j) -27												
4	$1 \times 4 = 4$, $4 + 8 = 12 \neq 36$ No, she did not work backwards. She needs to do the inverse operations in the other order: $36 - 8 = 28$ $28 \div 4 = 7$ The input is 7												
5	a) 7 b) 7 c) 38 d) -1 e) 6.2 f) 10.75												
6	a) <table style="margin-left: 20px;"> <tr> <td style="text-align: center;">input</td> <td></td> <td style="text-align: center;">output</td> </tr> <tr> <td style="text-align: center;"><input style="width: 40px; height: 30px;" type="text"/></td> <td style="text-align: center;">→ × 2 →</td> <td style="text-align: center;"><input style="width: 40px; height: 30px; border: 1px solid black;" type="text" value="80"/></td> </tr> </table> b) 39 c) <table style="margin-left: 20px;"> <tr> <td style="text-align: center;">input</td> <td></td> <td style="text-align: center;">output</td> </tr> <tr> <td style="text-align: center;"><input style="width: 40px; height: 30px;" type="text"/></td> <td style="text-align: center;">→ ÷ 2 →</td> <td style="text-align: center;"><input style="width: 40px; height: 30px; border: 1px solid black;" type="text" value="15.9"/></td> </tr> </table> d) 45.8 e) Children can check that their partner is working out the inverse operations in the correct order.	input		output	<input style="width: 40px; height: 30px;" type="text"/>	→ × 2 →	<input style="width: 40px; height: 30px; border: 1px solid black;" type="text" value="80"/>	input		output	<input style="width: 40px; height: 30px;" type="text"/>	→ ÷ 2 →	<input style="width: 40px; height: 30px; border: 1px solid black;" type="text" value="15.9"/>
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<input style="width: 40px; height: 30px;" type="text"/>	→ ÷ 2 →	<input style="width: 40px; height: 30px; border: 1px solid black;" type="text" value="15.9"/>											

Question	Answer
1	<p>a)</p>  <p>The other function machine has added 5 green blocks instead of 5 units after multiplying by 2</p> <p>b) The function machines both show $2 \times$ the input + 5 units, but the top function shows them as 5 separate units, whereas the bottom function machine shows them in a single bar.</p> <p>c) different possible ways of representing this, e.g.:</p> 
2	<p>a) 6 has been added to the 4 of $4p$. The answer should be $4p + 6$</p> <p>b) Only g has been multiplied by 4, not the 6 as well. The answer should be $4g + 24$</p> <p>c) Only 6 has been multiplied by 4, not the m as well. The answer should be $4m + 24$</p>
3	<p>a) $4m + 1$</p> <p>b) $4m + 4$</p> <p>c) $6h - 2$</p>
4	<p>bar model showing $3b + 6 = 3(b + 2)$</p> 
5	<p>a) $2.5d + 4$</p> <p>b) $2e - 6.8$</p> <p>c) $\frac{f}{2} + 1$</p>
6	<p>a) $6g + 7$</p> <p>b) $2h + \frac{3}{4}$</p> <p>c) $\frac{7p}{3} - 5$</p>
7	<p>a) m</p> <p>b) $6r$</p> <p>c) $9t$</p>

Question	Answer
8	<p>a)</p> $x \rightarrow \times 5 \xrightarrow{5x} \times 2 \rightarrow 10x$ $x \rightarrow \times 10 \rightarrow 10x$ <p>b)</p>  <p>c) Function machines that use a combination of addition and subtraction or a combination of multiplication and division can be written as a single step.</p>

Question	Answer
1	a) $+3$ b) $\times 2$ c) -5 d) $\div 2$ e) $\div 4$ f) -6
2	a) $\times 5 \rightarrow +2$ b) $\div 5 \rightarrow +2$ c) $\div 8 \rightarrow +6$ d) $\times 8 \rightarrow +6$
3	Alex has put the operations the wrong way wrong. She should have put $+3$, then $\times 7$
4	<p>a) </p> <p>b) </p> <p>c) </p> <p>d) </p> <p>Each pair of function machines uses the same operations but in the opposite order.</p>
5	<p></p> <p>The function machines have the same operations but in the opposite order.</p>

Question	Answer
6	<p>a)</p>  <p>b)</p> 
7	<p>a) $\times 2 \rightarrow + 7$ b) $\div 5 \rightarrow + 4$</p>
8	<div style="display: flex; align-items: center; gap: 20px;"> <div style="border: 1px solid black; padding: 2px 10px;">$2x - 10$</div> <div style="border: 1px solid black; padding: 2px 10px;">$10 - 2x$ ✓</div> </div> <p>$2x$ is subtracted from 10, not subtract 10</p>

Y7 - Autumn - Block 2 - Step 10 - Substitute into 2-step expressions Answers

Question	Answer
1	a) 20 b) 24 c) 20 d) 20
2	<p>input 3 → ×4 → +5 → output 17</p> <p>input 3 → +5 → ×4 → output 32</p>
3	a) $3z + 7 = 25$ $2z - 5 = 7$ $10z + 6.3 = 66.3$ b) $3(z + 7) = 39$ $2(z - 5) = 2$ $10(z + 5.3) = 113$ c) $4 + z = 10$ $4 + 3z = 22$ $20 - 2z = 8$ d) $\frac{z-1}{5} = 1$ $\frac{z}{3} + 2 = 4$ $3 + \frac{z}{2} = 6$
4	a) She should have squared the 3 first. $3^2 = 9$ $4 \times 9 = 36$ b) brackets: $(4x)^2$ c) 50 100 100 400

Y7 – Autumn – Block 2 – Step 10 – Substitute into 2-step expressions Answers (continued)

Question	Answer
5	a) 16.5 b) 15.5 c) -15.5 d) 32 e) 0.03125 or $\frac{1}{32}$ f) 8 g) 44.5 h) 4 i) -4 j) 256 k) 768 l) 2,304 m) 4 n) 16
6	a) $5(m + 1) = 5m + 5$ b) $5m + 1 + 4 = 5m + 5$

Question	Answer																																				
1	<p>a) <table border="1" style="display: inline-table; vertical-align: middle;"> <tr><td>n</td><td>1</td><td>2</td><td>3</td></tr> <tr><td>$4n$</td><td>4</td><td>8</td><td>12</td></tr> </table></p> <p>b) <table border="1" style="display: inline-table; vertical-align: middle;"> <tr><td>n</td><td>1</td><td>2</td><td>3</td></tr> <tr><td>$2n + 3$</td><td>5</td><td>7</td><td>9</td></tr> </table></p> <p>c) <table border="1" style="display: inline-table; vertical-align: middle;"> <tr><td>n</td><td>1</td><td>2</td><td>3</td></tr> <tr><td>$7n - 1$</td><td>6</td><td>13</td><td>20</td></tr> </table></p>	n	1	2	3	$4n$	4	8	12	n	1	2	3	$2n + 3$	5	7	9	n	1	2	3	$7n - 1$	6	13	20												
n	1	2	3																																		
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2	<p>a) <table border="1" style="display: inline-table; vertical-align: middle;"> <tr><td>n</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr> <tr><td>$5n$</td><td>5</td><td>10</td><td>15</td><td>20</td><td>25</td></tr> </table></p> <p>b) <table border="1" style="display: inline-table; vertical-align: middle;"> <tr><td>n</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr> <tr><td>$5n - 5$</td><td>0</td><td>5</td><td>10</td><td>15</td><td>20</td></tr> </table></p> <p>c) <table border="1" style="display: inline-table; vertical-align: middle;"> <tr><td>n</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr> <tr><td>$5n + 2$</td><td>7</td><td>12</td><td>17</td><td>22</td><td>27</td></tr> </table></p> <p>All the sequences go up by 5 each time, but the starting number is different.</p>	n	1	2	3	4	5	$5n$	5	10	15	20	25	n	1	2	3	4	5	$5n - 5$	0	5	10	15	20	n	1	2	3	4	5	$5n + 2$	7	12	17	22	27
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$5n + 2$	7	12	17	22	27																																
3	<p>a) -4, 2, 8, 14, 20 b) 10, 13, 16, 19, 22 c) -0.5, 0, 0.5, 1, 1.5 d) 6.3, 10.3, 14.3, 18.3, 22.3 e) 1.5, 1.75, 2, 2.25, 2.5 f) 5.25, 5.5, 5.75, 6, 6.25</p> <p>Substitute $n = 1$ to 5 in the expressions. Some students may find the first term and then add the coefficient of n each time.</p>																																				
4	<p>a) 18, 16, 14, 12 b) -3, -7, -11, -15</p>																																				
5	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 5px; margin: 5px;">$3n - 9$</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">$9 - 3n$</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">$-9 + 3n$</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">$-3n - 9$</div> </div> <p style="text-align: center; margin-top: 10px;"> <u>ascending</u> <u>descending</u> <u>ascending</u> <u>descending</u> </p> <p>When the term in n is positive, the sequence is ascending.</p>																																				
6	<p>$\frac{n-7}{2}$ ✓ $(n-7)^2$ $n^2 - 7$ $0.2n - 7$ ✓ $2 - 7n$ ✓ $\frac{n}{2} - 7$ ✓</p> <p>The highest power of n is 1</p>																																				

Y7 – Autumn – Block 2 – Step 11 – Generate sequences from a rule Answers (continued)

Question	Answer
7	a) 3rd b) 190 c) No, because all the terms are even. d) No Solving the sequence rule for a value of 68 gives $4n = 68 + 10 = 78$ and 78 is not a multiple of 4
8	a) 770 b) Any two terms that are 10 positions apart

Y7 – Autumn – Block 2 – Step 12 – Represent functions graphically Answers

Question	Answer																
1	a) line $y = 3x + 1$ plotted using a graphing program b) They have the same coordinates. c) The points for a sequences do not join up because we cannot have a decimal position of a term.																
2	a) They are both straight lines sloping upwards from left to right. b) They are both straight lines sloping downwards from left to right. c) They are both horizontal.																
3	The lines in part a), b) and c) are straight lines, so relate to linear sequences. The line in part d) is not a straight line, so relates to a non-linear sequence.																
4	a) Both graphs go through (0, 0) and always slope upwards from left to right. $y = 3x$ is a straight line and $y = x^3$ is a curve. b) $y = 3x$ c) $y = x^3$																
5	<table border="0" style="width: 100%; text-align: center;"> <tr> <td style="border: 1px solid black; padding: 5px;">$y = 2x$</td> <td style="border: 1px solid black; padding: 5px;">$y = x^2$</td> <td style="border: 1px solid black; padding: 5px;">$y = x^2 + 2$</td> <td style="border: 1px solid black; padding: 5px;">$y = x^2 - 2$</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td style="border: 1px solid black; padding: 5px;">$y = 2x^2$</td> <td style="border: 1px solid black; padding: 5px;">$y = 2^x$</td> <td style="border: 1px solid black; padding: 5px;">$y = \frac{2}{x}$</td> <td></td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td></td> </tr> </table>	$y = 2x$	$y = x^2$	$y = x^2 + 2$	$y = x^2 - 2$	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	$y = 2x^2$	$y = 2^x$	$y = \frac{2}{x}$		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
$y = 2x$	$y = x^2$	$y = x^2 + 2$	$y = x^2 - 2$														
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$y = 2x^2$	$y = 2^x$	$y = \frac{2}{x}$															
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>															
6	The only power of x is 1																
7	<table border="0" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> a) $y = 2x - 5$ <input checked="" type="checkbox"/> b) $y = 5 - 2x$ <input checked="" type="checkbox"/> c) $y = 2(x - 5)$ <input checked="" type="checkbox"/> d) $y = x^2 + 5$ <input type="checkbox"/> e) $y = 2x^2 + 5$ <input type="checkbox"/> f) $y = 0.2x - 5$ <input checked="" type="checkbox"/> g) $y = -5 - 0.2x$ <input checked="" type="checkbox"/> </td> <td style="width: 50%; vertical-align: top;"> h) $y = \frac{x}{2} + 5$ <input checked="" type="checkbox"/> i) $y = \frac{1}{2}x + 5$ <input checked="" type="checkbox"/> j) $y = 5 - \frac{1}{2}x$ <input checked="" type="checkbox"/> k) $y = 2x$ <input checked="" type="checkbox"/> l) $y = \frac{x}{2}$ <input checked="" type="checkbox"/> m) $y = \frac{2}{x}$ <input type="checkbox"/> n) $y = 2$ <input checked="" type="checkbox"/> </td> </tr> </table>	a) $y = 2x - 5$ <input checked="" type="checkbox"/> b) $y = 5 - 2x$ <input checked="" type="checkbox"/> c) $y = 2(x - 5)$ <input checked="" type="checkbox"/> d) $y = x^2 + 5$ <input type="checkbox"/> e) $y = 2x^2 + 5$ <input type="checkbox"/> f) $y = 0.2x - 5$ <input checked="" type="checkbox"/> g) $y = -5 - 0.2x$ <input checked="" type="checkbox"/>	h) $y = \frac{x}{2} + 5$ <input checked="" type="checkbox"/> i) $y = \frac{1}{2}x + 5$ <input checked="" type="checkbox"/> j) $y = 5 - \frac{1}{2}x$ <input checked="" type="checkbox"/> k) $y = 2x$ <input checked="" type="checkbox"/> l) $y = \frac{x}{2}$ <input checked="" type="checkbox"/> m) $y = \frac{2}{x}$ <input type="checkbox"/> n) $y = 2$ <input checked="" type="checkbox"/>														
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