

Reasoning and Problem Solving

Step 1: Add and Subtract Integers

National Curriculum Objectives:

Mathematics Year 6: (6C8) [Solve problems involving addition, subtraction, multiplication and division](#)

Differentiation:

Questions 1, 4 and 7 (Problem Solving)

Developing Investigate which two 5-digit numbers could have been added or subtracted in order to reach a given number.

Expected Investigate which two 6-digit numbers (within a given parameter) could have been added or subtracted in order to reach a given number.

Greater Depth Investigate which two 6-digit numbers (within a given parameter) could have been added or subtracted in order to reach a given number. Numbers represented in numerals and words.

Questions 2, 5 and 8 (Problem Solving)

Developing Mixture of looped subtraction and addition calculations using 5-digit numbers with three missing numbers using up to one exchange.

Expected Mixture of looped subtraction and addition calculations using 6-digit numbers with three missing numbers using up to two exchanges.

Greater Depth Mixture of looped subtraction and addition calculations in using 6-digit numbers with three missing numbers using multiple exchanges.

Questions 3, 6 and 9 (Reasoning)

Developing Explain whether a statement about addition and subtraction is correct. Using 5-digit numbers and up to one exchange.

Expected Explain whether a statement about addition and subtraction is correct. Using 6-digit numbers and up to two exchanges.

Greater Depth Explain whether a statement about addition and subtraction is correct. Using 6-digit numbers and multiple exchanges. Numbers represented in numerals and words.

More [Year 5 and Year 6 Addition and Subtraction](#) resources.

Did you like this resource? Don't forget to [review](#) it on our website.

Add and Subtract Integers

Add and Subtract Integers

1a. The answer to an addition calculation using two 5-digit numbers is 65,871.

What could the calculation be?



6 PS

1b. The answer to a subtraction calculation using two 5-digit numbers is 37,824.

What could the calculation be?



6 PS

2a. Use the numbers below to fill in the blanks so the calculations are correct.

<div style="border: 1px solid black; border-radius: 15px; width: 60px; height: 60px; display: flex; align-items: center; justify-content: center; margin: 0 auto;">10,129</div> + <div style="border: 1px solid green; border-radius: 15px; width: 60px; height: 60px; display: flex; align-items: center; justify-content: center; margin: 0 auto;">A</div> = <div style="border: 1px solid black; border-radius: 15px; width: 60px; height: 60px; display: flex; align-items: center; justify-content: center; margin: 0 auto;">30,996</div>
<div style="display: flex; align-items: center; justify-content: center; margin: 10px 0;"> + <div style="border: 1px solid black; border-radius: 15px; width: 60px; height: 60px; display: flex; align-items: center; justify-content: center; margin: 0 5px;">20,657</div> - <div style="border: 1px solid green; border-radius: 15px; width: 60px; height: 60px; display: flex; align-items: center; justify-content: center; margin: 0 5px;">B</div> </div>
<hr style="width: 100%; border: 0.5px solid black; margin: 5px 0;"/> <div style="display: flex; align-items: center; justify-content: center; margin: 10px 0;"> <div style="border: 1px solid black; border-radius: 15px; width: 60px; height: 60px; display: flex; align-items: center; justify-content: center; margin: 0 5px;">30,786</div> - <div style="border: 1px solid green; border-radius: 15px; width: 60px; height: 60px; display: flex; align-items: center; justify-content: center; margin: 0 10px;">C</div> = <div style="border: 1px solid black; border-radius: 15px; width: 60px; height: 60px; display: flex; align-items: center; justify-content: center; margin: 0 5px;">18,153</div> </div>
<div style="display: flex; justify-content: space-around; margin-top: 20px;"> <div style="border: 1px solid green; border-radius: 15px; width: 100px; height: 30px; display: flex; align-items: center; justify-content: center;">12,843</div> <div style="border: 1px solid green; border-radius: 15px; width: 100px; height: 30px; display: flex; align-items: center; justify-content: center;">20,867</div> <div style="border: 1px solid green; border-radius: 15px; width: 100px; height: 30px; display: flex; align-items: center; justify-content: center;">12,633</div> </div>



6 PS

2b. Use the numbers below to fill in the blanks so the calculations are correct.

<div style="border: 1px solid black; border-radius: 15px; width: 60px; height: 60px; display: flex; align-items: center; justify-content: center; margin: 0 auto;">22,806</div> + <div style="border: 1px solid green; border-radius: 15px; width: 60px; height: 60px; display: flex; align-items: center; justify-content: center; margin: 0 auto;">B</div> = <div style="border: 1px solid black; border-radius: 15px; width: 60px; height: 60px; display: flex; align-items: center; justify-content: center; margin: 0 auto;">45,921</div>
<div style="display: flex; align-items: center; justify-content: center; margin: 10px 0;"> + <div style="border: 1px solid green; border-radius: 15px; width: 60px; height: 60px; display: flex; align-items: center; justify-content: center; margin: 0 5px;">A</div> - <div style="border: 1px solid green; border-radius: 15px; width: 60px; height: 60px; display: flex; align-items: center; justify-content: center; margin: 0 5px;">C</div> </div>
<hr style="width: 100%; border: 0.5px solid black; margin: 5px 0;"/> <div style="display: flex; align-items: center; justify-content: center; margin: 10px 0;"> <div style="border: 1px solid black; border-radius: 15px; width: 60px; height: 60px; display: flex; align-items: center; justify-content: center; margin: 0 5px;">34,236</div> - <div style="border: 1px solid black; border-radius: 15px; width: 60px; height: 60px; display: flex; align-items: center; justify-content: center; margin: 0 10px;">19,656</div> = <div style="border: 1px solid black; border-radius: 15px; width: 60px; height: 60px; display: flex; align-items: center; justify-content: center; margin: 0 5px;">14,580</div> </div>
<div style="display: flex; justify-content: space-around; margin-top: 20px;"> <div style="border: 1px solid green; border-radius: 15px; width: 100px; height: 30px; display: flex; align-items: center; justify-content: center;">31,341</div> <div style="border: 1px solid green; border-radius: 15px; width: 100px; height: 30px; display: flex; align-items: center; justify-content: center;">23,115</div> <div style="border: 1px solid green; border-radius: 15px; width: 100px; height: 30px; display: flex; align-items: center; justify-content: center;">11,430</div> </div>



6 PS

3a. Michael chooses a number between 10,000 and 15,000. He adds 23,154. His answer is 33,904.



My starting number is 10,650.

Is Michael correct? Explain your answer.



6 R

3b. Jonathan chooses a number between 25,000 and 30,000. He subtracts 10,124. His answer is 15,483.



My starting number is 25,607.

Is Jonathan correct? Explain your answer.



6 R

Add and Subtract Integers

Add and Subtract Integers

4a. The answer to an addition calculation using two 6-digit numbers is 456,782.

For one of the numbers, the thousands digit is even.

What could the calculation be?



6 PS

4b. The answer to a subtraction calculation using two 6-digit numbers is 130,509.

For one of the numbers, the tens digit is odd.

What could the calculation be?



6 PS

5a. Use the numbers below to fill in the blanks so the calculations are correct.

<div style="border: 1px solid black; border-radius: 15px; width: 60px; height: 60px; display: flex; align-items: center; justify-content: center;">325,412</div>	+	<div style="border: 1px solid black; border-radius: 15px; width: 60px; height: 60px; display: flex; align-items: center; justify-content: center;">124,607</div>	=	<div style="border: 1px solid black; border-radius: 15px; width: 60px; height: 60px; display: flex; align-items: center; justify-content: center;">C</div>
+	<div style="border: 1px solid black; border-radius: 15px; width: 60px; height: 60px; display: flex; align-items: center; justify-content: center;">A</div>		-	<div style="border: 1px solid black; border-radius: 15px; width: 60px; height: 60px; display: flex; align-items: center; justify-content: center;">323,054</div>
<div style="border: 1px solid black; border-radius: 15px; width: 60px; height: 60px; display: flex; align-items: center; justify-content: center;">642,187</div>	-	<div style="border: 1px solid black; border-radius: 15px; width: 60px; height: 60px; display: flex; align-items: center; justify-content: center;">B</div>	=	<div style="border: 1px solid black; border-radius: 15px; width: 60px; height: 60px; display: flex; align-items: center; justify-content: center;">126,965</div>
<div style="border: 1px solid black; border-radius: 15px; width: 60px; height: 30px; display: flex; align-items: center; justify-content: center;">515,222</div>	<div style="border: 1px solid black; border-radius: 15px; width: 60px; height: 30px; display: flex; align-items: center; justify-content: center;">316,775</div>	<div style="border: 1px solid black; border-radius: 15px; width: 60px; height: 30px; display: flex; align-items: center; justify-content: center;">450,019</div>		



6 PS

5b. Use the numbers below to fill in the blanks so the calculations are correct.

<div style="border: 1px solid black; border-radius: 15px; width: 60px; height: 60px; display: flex; align-items: center; justify-content: center;">A</div>	+	<div style="border: 1px solid black; border-radius: 15px; width: 60px; height: 60px; display: flex; align-items: center; justify-content: center;">482,332</div>	=	<div style="border: 1px solid black; border-radius: 15px; width: 60px; height: 60px; display: flex; align-items: center; justify-content: center;">C</div>
+	<div style="border: 1px solid black; border-radius: 15px; width: 60px; height: 60px; display: flex; align-items: center; justify-content: center;">155,010</div>		-	<div style="border: 1px solid black; border-radius: 15px; width: 60px; height: 60px; display: flex; align-items: center; justify-content: center;">122,362</div>
<div style="border: 1px solid black; border-radius: 15px; width: 60px; height: 60px; display: flex; align-items: center; justify-content: center;">B</div>	+	<div style="border: 1px solid black; border-radius: 15px; width: 60px; height: 60px; display: flex; align-items: center; justify-content: center;">204,960</div>	=	<div style="border: 1px solid black; border-radius: 15px; width: 60px; height: 60px; display: flex; align-items: center; justify-content: center;">521,872</div>
<div style="border: 1px solid black; border-radius: 15px; width: 60px; height: 30px; display: flex; align-items: center; justify-content: center;">316,912</div>	<div style="border: 1px solid black; border-radius: 15px; width: 60px; height: 30px; display: flex; align-items: center; justify-content: center;">644,234</div>	<div style="border: 1px solid black; border-radius: 15px; width: 60px; height: 30px; display: flex; align-items: center; justify-content: center;">161,902</div>		



6 PS

6a. Trevor chooses a number between 200,000 and 300,000. He adds 104,709 and then subtracts 210,834. His answer is 108,429.



My starting number is 214,554.

Is Trevor correct? Explain your answer.



6 R

6b. Jazmin chooses a number between 200,000 and 300,000. She subtracts 123,468 and then adds 156,812. Her answer is 274,216.



My starting number is 230,872.

Is Jazmin correct? Explain your answer.



6 R

Add and Subtract Integers

Add and Subtract Integers

7a. The answer to an addition calculation using two 6-digit numbers is one million, ninety-eight thousand, three hundred and fifty-four.

One 6-digit number has only even digits.

What could the calculation be?



6 PS

7b. The answer to a subtraction calculation using two 6-digit numbers is seven hundred and twenty-four thousand, four hundred and twenty-seven.

One 6-digit number has only odd digits.

What could the calculation be?



6 PS

8a. Use the numbers below to fill in the blanks so the calculations are correct.

$$\begin{array}{r}
 \boxed{497,576} + \boxed{101,464} = \boxed{C} \\
 + \boxed{B} \qquad \qquad \qquad - \boxed{451,879} \\
 \hline
 \boxed{A} - \boxed{504,070} = \boxed{147,161}
 \end{array}$$



6 PS

8b. Use the numbers below to fill in the blanks so the calculations are correct.

$$\begin{array}{r}
 \boxed{B} + \boxed{260,843} = \boxed{454,742} \\
 + \boxed{A} \qquad \qquad \qquad - \boxed{309,635} \\
 \hline
 \boxed{843,412} - \boxed{C} = \boxed{145,107}
 \end{array}$$



6 PS

9a. Darren chooses a number between 130,000 and 140,000. He adds 785,933 and then subtracts 345,785. His answer is five hundred and seventy-one thousand, four hundred and thirty-three.



My starting number is 132,285.

Is Darren correct? Explain your answer.



6 R

9b. Lily chooses a number between 400,000 and 410,000. She subtracts 130,982 and then adds 182,769. Her answer is four hundred and sixty thousand, one hundred and thirty-two.



My starting number is 408,345.

Is Lily correct? Explain your answer.



6 R

Reasoning and Problem Solving Add and Subtract Integers

Developing

- 1a. Various answers, for example: $23,012 + 42,859 = 65,871$
2a. A: 20,867; B: 12,843; C: 12,633
3a. Michael is incorrect because $33,904 - 23,154 = 10,750$ not 10,650.

Expected

- 4a. Various answers, for example: $202,836 + 253,946 = 456,782$
5a. A: 316,775; B: 515,222; C: 450,019
6a. Trevor is correct because $210,834 + 108,429 = 319,263$ and $319,263 - 104,709 = 214,554$.

Greater Depth

- 7a. Various answers, for example: $849,712 + 248,642 = 1,098,354$
8a. A: 651,231; B: 153,655; C: 599,040
9a. Darren is incorrect because $571,433 + 345,785 = 917,218$ and $917,218 - 785,933 = 131,285$ not 132,285.

Reasoning and Problem Solving Add and Subtract Integers

Developing

- 1b. Various answers, for example: $68,756 - 30,932 = 37,824$
2b. A: 11,430; B: 23,115; C: 31,341
3b. Jonathan is correct because $14,483 + 10,124 = 25,607$.

Expected

- 4b. Various answers, for example: $902,957 - 772,448 = 130,509$
5b. A: 161,902; B: 316,912; C: 644,234
6b. Jazmin is incorrect because $274,216 - 156,812 = 117,404$ and $117,404 + 123,468 = 240,872$ not 230,872.

Greater Depth

- 7b. Various answers, for example: $915,331 - 190,904 = 724,427$
8b. A: 649,513; B: 193,899; C: 698,305
9b. Lily is correct because $460,132 - 182,769 = 277,363$ and $277,363 + 130,982 = 408,345$.