

Reasoning and Problem Solving

Step 9: Find Pairs of Values 1

National Curriculum Objectives:

Mathematics Year 6: (6A4) [Find pairs of numbers that satisfy an equation with two unknowns](#)

Differentiation:

Questions 1, 4 and 7 (Reasoning)

Developing Explain whether a pair of values could be possible in the given equation. Using whole numbers less than 20.

Expected Explain whether a pair of values could be possible in the given equation. Using whole numbers.

Greater Depth Explain whether a pair of values could be possible in the given equation. Using decimals.

Questions 2, 5 and 8 (Problem Solving)

Developing Work out the possible values of a and b using the given equations and answers, using addition, subtraction, multiplication, and whole numbers less than 20.

Expected Work out the possible values of a and b using the given equations and answers, using all 4 operations and whole numbers.

Greater Depth Work out the possible values of a and b using the given equations and answers, using all 4 operations and whole numbers, decimals and fractions.

Questions 3, 6 and 9 (Reasoning)

Developing Explain whether a statement is correct when finding the value of pairs, using division and whole numbers less than 20.

Expected Explain whether a statement is correct when finding the value of pairs, using division and whole numbers.

Greater Depth Explain whether a statement is correct when finding the value of pairs, using division and multiplication with decimal and negative numbers.

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Find Pairs of Values 1

1a. Felicity writes the following equation:

$$a + b = 16$$

For one of the possible pairs, she has written:

$$a = 8 \text{ and } b = 8$$

Is she correct? Explain your answer.



R

Find Pairs of Values 1

1b. Aaron writes the following equation:

$$a \times b = 18$$

For one of the possible pairs, he has written:

$$a = 10 \text{ and } b = 8$$

Is he correct? Explain your answer.



R

2a. What pair of values have been used in the following equations if the values are always the same?

$$a + b = 7$$

$$a \times b = 12$$

$$a - b = 1$$



PS

2b. What pair of values have been used in the following equations if the values are always the same?

$$a \times b = 10$$

$$a - b = 3$$

$$a + b = 7$$



PS

3a. Richie is finding pairs of values for the equation below.

$$a \div b = 17$$

He says,



One value must be 1 because the answer is a prime number.

Is Richie correct? Explain why.



R

3b. Saima is finding pairs of values for the equation below.

$$a \div b = 2$$

She says,



One of the values must be even as the answer is an even number.

Is Saima correct? Explain why.



R

Find Pairs of Values 1

4a. Elodie writes the following equation:

$$a \div b = 7$$

For one of the possible pairs, she has written:

$$a = 7 \text{ and } b = 49$$

Is she correct? Explain your answer.



R

Find Pairs of Values 1

4b. Daley writes the following equation:

$$a \div b = 6$$

For one of the possible pairs, he has written:

$$a = 36 \text{ and } b = 6$$

Is he correct? Explain your answer.



R

5a. What pair of values have been used in the following equations if the values are always the same?

$$a + b = 16$$

$$a \times b = 48$$

$$a \div b = 3$$

$$a - b = 8$$



PS

5b. What pair of values have been used in the following equations if the values are always the same?

$$a + b = 21$$

$$a \times b = 54$$

$$a \div b = 6$$

$$a - b = 15$$



PS

6a. Josey is finding pairs of values for the equation below.

$$a \div b = 9$$

She says,



One value must be a multiple of 3 because 9 is a multiple of 3.

Is Josey correct? Explain why.



R

6b. Russell is finding pairs of values for the equation below.

$$a \div b = 7$$

He says,



Both values can't be even because 7 is odd.

Is Russell correct? Explain why.



R

Find Pairs of Values 1

7a. Polly writes the following equation:

$$a \div b = 3.5$$

For one of the possible pairs, she has written:

$$a = 8 \text{ and } b = 28$$

Is she correct? Explain your answer.



R

Find Pairs of Values 1

7b. Guy writes the following equation:

$$a \div b = 4.2$$

For one of the possible pairs, he has written:

$$a = 21 \text{ and } b = 5$$

Is he correct? Explain your answer.



R

8a. What pair of values have been used in the following equations if the values are always the same?

$$a + b = 84.5$$

$$a \times b = 42$$

$$a \div b = 168$$

$$a - b = 83.5$$



PS

8b. What pair of values have been used in the following equations if the values are always the same?

$$a + b = 12\frac{3}{4}$$

$$a \times b = 9$$

$$a \div b = 16$$

$$a - b = 11\frac{1}{4}$$



PS

9a. Evan is finding pairs of values for the equation below.

$$a \times b = -60$$

He says,



Both values must be a negative number because the answer is a negative number.

Is Evan correct? Explain why.



R

9b. Kirsty is finding pairs of values for the equation below.

$$a \div b = 19.5$$

She says,



Value b must be an odd number because the answer is a decimal.

Is Kirsty correct? Explain why.



R

Reasoning and Problem Solving Find Pairs of Values 1

Developing

1a. Felicity is incorrect as because both letters would represent 8, but each letter should represent a different number.

2a. $a = 4$; $b = 3$

3a. Richie is incorrect because 17 is not being divided, it is the answer.

Expected

4a. Elodie is incorrect because $7 \div 49$ would give an answer less than 1. Her numbers would work if she swapped them around.

5a. $a = 12$; $b = 4$

6a. Josey is correct because to give an answer of 9, the number being divided must be a multiple of 9. Anything that can be divided by 9, can also be divided by 3. Example: $18 \div 9 = 2$, $18 \div 3 = 6$.

Greater Depth

7a. Polly is incorrect because $8 \div 28$ would give an answer less than 1. Her numbers would work if she swapped them around.

8a. $a = 84$; $b = 0.5$

9a. Evan is incorrect because when two negative numbers are multiplied, the answer is positive. Example: $-2 \times -5 = 10$.

Reasoning and Problem Solving Find Pairs of Values 1

Developing

1b. Aaron is incorrect because $10 \times 8 = 80$. His values would work if the equation used addition.

2b. $a = 5$; $b = 2$

3b. Saima is correct because only even numbers give an answer of 2 when divided. Example: $16 \div 8 = 2$.

Expected

4b. Daley is correct because $36 \div 6 = 6$.

5b. $a = 18$; $b = 3$

6b. Russell is incorrect because division with two even numbers always produces an odd answer. Example: $10 \div 2 = 5$.

Greater Depth

7b. Guy is correct because $21 \div 5 = 4.2$

8b. $a = 12$; $b = 0.75$

9b. Kirsty is incorrect because dividing by an even number can still give a decimal answer. Example: $117 \div 6 = 19.5$.