Reasoning and Problem Solving
Step 10: Find Pairs of Values 2

National Curriculum Objectives:

Mathematics Year 6: (6A5) Enumerate possibilities of combinations of two variables

Differentiation:

Questions 1, 4 and 7 (Reasoning)
Developing Explain whether a statement is correct. Involves multiples of one unknown, using all four operations and whole numbers less than 20.
Expected Explain whether a statement is correct. Involves multiples of one or more unknown, using all four operations and whole numbers.
Greater Depth Explain whether a statement is correct. Involves multiples of one or more unknown, using all four operations with whole numbers, decimals and fractions.

Questions 2, 5 and 8 (Reasoning)
Developing Explain which statements could be true. Involves multiples of one unknown, using all four operations and whole numbers less than 20.
Expected Explain which statements could be true. Involves multiples of one or more unknown, using all four operations and whole numbers.
Greater Depth Explain which statements could be true. Involves multiples of one or more unknown, using all four operations with whole numbers, decimals and negative numbers.

Questions 3, 6 and 9 (Problem Solving)
Developing Find the possible values of two letters to make a total. Involves multiples of one or more unknown, using all four operations and whole numbers less than 20.
Expected Find the possible values of two letters to make a total. Involves multiples of one or more unknown, using all four operations and whole numbers.
Greater Depth Find the possible values of two letters to make a total. Involves multiples of one or more unknown, using all four operations with whole numbers and decimals.

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Find Pairs of Values 2

1a. Katya is finding possible values for a and b.

$$2a + b = 18$$



If a equals 7, b must equal 5.

Is Katya correct? Explain your answer.

D R

Find Pairs of Values 2

1b. Jesse is finding possible values for c and d.

$$2c - d = 12$$



If c equals 10, d must equal 2.

Is Jesse correct? Explain your answer.

D R

2a. If a is an odd number and b is 2, which of these could be true?

A. $2a + 2b = 14$

B. $a \times b = 9$

C. $2a \times b = 12$

D. $a + 2b = 9$

Convince me.

D R

2b. If a is 5 and b is an even number, which of these could be true?

A. $a + 2b = 12$

B. $2a + b = 16$

C. $2a \times b = 20$

D. $a + b = 8$

Convince me.

D R

3a. Pizza 2 Go sells 2 medium pizzas and one small pizza for £16. What possible prices can you find for each pizza?

$$2m + s = £16$$

m	s

D PS

3b. Happy Hats sell 2 knitted hats and 2 baseball caps for £18. What possible prices can you find for each hat?

$$2k + 2b = £18$$

k	b

D PS

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Find Pairs of Values 2

4a. Vivian is finding possible values for h and i.

$$5h + 3i = 50$$



If h equals 7, i must equal 15.

Is Vivian correct? Explain your answer.

E R

4b. Ralph is finding possible values for x and y.

$$2x + 5y = 40$$



If x equals 15, y must equal 10.

Is Ralph correct? Explain your answer.

E R

5a. If a is an odd number and b is 25, which of these could be true?

A. $2a + 3b = 105$

B. $a + a - 4b = 4$

C. $4a \div 4b = 20$

D. $3a + 3b = 96$

Convince me.

E R

5b. If a is an even number and b is 4, which of these could be true?

A. $5a + b = 15$

B. $3a + 3b = 42$

C. $2a + 5b = 36$

D. $2a \times b = 48$

Convince me.

E R

6a. Coats 'r' Us sell 2 medium coats and 4 small coats for £100. What possible prices can you find for each coat?

$$2m + 4s = £100$$

m	s

E PS

6b. Yum Wings sell 4 small chicken dippers and 2 large chicken buckets for £80. What possible prices can you find for each meal?

$$4s + 2l = £80$$

s	l

E PS

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Find Pairs of Values 2

7a. Gillian is finding possible values for x and y.

$$7x + 2y = 12.5$$



If x equals $\frac{1}{2}$, y must equal 5.5.

Is Gillian correct? Explain your answer.

GD R

7b. Faisan is finding possible values for a and b.

$$2a - 5b = -5$$



If a equals 2.5, b must equal 10.

Is Faisan correct? Explain your answer.

GD R

8a. If a is a negative number and b is 7, which of these could be true?

A. $a + b = 0$

B. $a + 3b = 16$

C. $a + 8b = 46$

D. $a + 2b - b = 3$

Convince me.

GD R

8b. If a is -5 and b is a decimal number, which of these could be true?

A. $a + b = -2.5$

B. $a + 3b = -3.5$

C. $a + 2b - b = 5.5$

D. $a - b = -9.5$

Convince me.

GD R

9a. CinePlaza sell 2 medium popcorn and 2 small popcorn for £17.50. What possible prices can you find for each popcorn?

$$2m + 2s = £17.50$$

m	s

GD PS

9b. Warm Wear sell 5 mittens and 5 hats for £22.50. What possible prices can you find for each item?

$$5m + 5h = £22.50$$

m	h

GD PS

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Reasoning and Problem Solving
Find Pairs of Values 2

Developing

1a. Katya is incorrect because 2 x 7 = 14; 14 + 4 = 18 so d = 4 not 5.

2a. A, C or D could be true. For example: A. a = 5; C. a = 3; D. a = 5

3a. Various answers, for example: m = 6, s = 4; m = 7, s = 2; m = 5, s = 6

Expected

4a. Vivian is incorrect because 5 x 7 = 35; 50 – 35 = 15. 15 ÷ 3 = 5 so i = 5.

5a. A or D could be true. For example: A. a = 15; B. a = 7

6a. Various answers, for example: m = 30, s = 10; m = 40, s = 5; m = 10, s = 20

Greater Depth

7a. Gillian is incorrect because 7 x $\frac{1}{2}$ = 3.5; 12.5 – 3.5 = 9. 9 ÷ 2 = 4.5 so y = 4.5.

8a. A, B, C or D could be true. For example: A. a = -7; B. a = -5; C. a = -10; D. a = -4

9a. Various answers, for example: m = 5, s = 3.75; m = 6, s = 2.75; m = 4, s = 4.75

Reasoning and Problem Solving
Find Pairs of Values 2

Developing

1b. Jesse is incorrect because 2 x 10 = 20; 20 – 8 = 12 so d = 8 not 2.

2b. B or C could be true. For example: B. b = 6; C. b = 2

3b. Various answers, for example: k = 4, b = 5; k = 3, b = 6; k = 7, b = 2

Expected

4b. Ralph is incorrect because 2 x 15 = 30; 40 – 30 = 10. 10 ÷ 5 = 2 so y = 2.

5b. B, C or D could be true. For example: B. a = 10; C. a = 8; D. a = 6

6b. Various answers, for example: s = 10, l = 20; s = 5, l = 30; s = 11, l = 18

Greater Depth

7b. Faisan is incorrect because 2 x 2.5 = 5; 5 – 10 = -5. 10 ÷ 5 = 2 so b = 2.

8b. A, B, C or D could be true. For example: A. b = 2.5; B. b = 0.5; C. b = 10.5; D. b = 4.5

9b. Various answers, for example: m = 1, h = 3.5; m = 2, h = 2.5; m = 3, h = 1.5

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