

Whole Number Subtraction and Proofs

Objective: Subtract mixed numbers and use properties to prove the differences.

Standard: NS2.1

Prerequisites: Adding numbers and decimals

Subtracting numbers on a number line with two column proofs

Part 1: the number line

Problem: –

See example below. Start by drawing a line. “What is this?”

[A line] (You may get responses like ‘a number line’. Clarify that it needs numbers to be a number line.)

“We get the numbers for the line from the problem. The lower number is the start of the line, on the left side, and the greater number is the end of the line, on the right side. What is the lower number?”

[18]

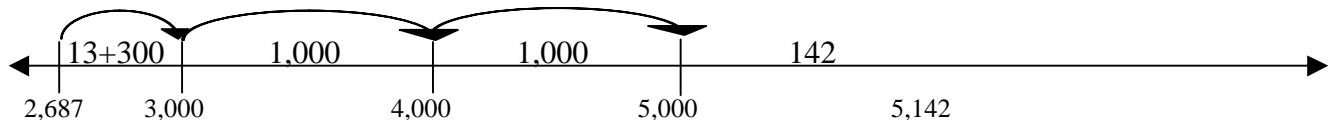
“What is the greater number?”

[] “Write this at the end of the number line”

“Let’s fill in the tens in between the numbers. What is the tens aft (ns) -0of () T0.3 (L)r0.2 (nd of) -0.5 (t)

“When we write numbers

Problem: $5,142 - 2,687$



$$= \quad + \quad + \quad +$$

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$$= (\quad + \quad) + (\quad + \quad) + (\quad + \quad) + (\quad + \quad)$$

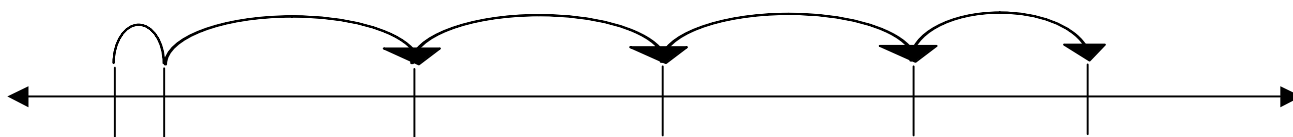
$$= \quad + \quad + \quad +$$

$$=$$

You try: $3,532 - 1,836$

And onto decimals...

Problem: !



$$0.2 + 1 + 1 + 1 + 0.7$$

$$1 + 1 + 1 + 0.2 + 0.7$$

Commutative property of addition

$$3 + 0.9$$

Combine like terms

$$\boxed{3.9}$$

Simplify

You Try: -

$$= 0.4 + 1 + 1 + 1 + 1 + 4$$

$$= (1 + 1 + 1 + 1) + (0.4 + 0.4)$$

$$= 4 + 0.8$$

$$= 4.8$$

Subtracting Mixed numbers on a number line with two column proofs

Part 1: the number line

Problem: $5\frac{2}{3} - 2\frac{1}{5}$

See example below. Start by drawing a line. “What is this?”

[A line] (You may get responses like ‘a number line’. Clarify that it needs numbers to be a number line.)

“We get the numbers for the line from the problem. The lower number is the start of the line, on the left side, and the greater number is the end of the line, on the right side. What is the lower number?”

[-]

“What is the greater number?”

[-] “Write this at the end of the number line”

“Let’s fill in the whole numbers in between the mixed numbers. What is the whole number after - ?”

[3]

“And after 3?”

[4]

“Then?”

[5]

“Would we write 6 on our number line?”

[No, because 6 is greater than -]

“Find the distance between each of the numbers. What is the distance between each of the whole numbers?”

[1]

“Let’s label it.”

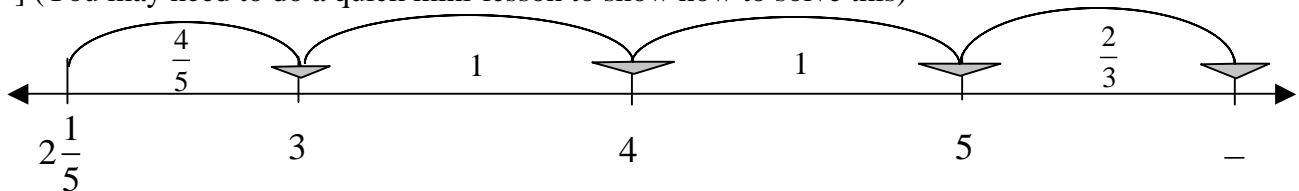
“What is the distance between 5 and - ?”

[-]

“What is the distance between $2\frac{1}{5}$ and 3?”

[-] (You may need to do a quick mini-lesson to show how to solve this)

<p>Mini-lesson:</p> $2\frac{1}{5} + \square = 3$ $2\frac{1}{5} + \square = 2 + 1$ $2\frac{1}{5} + \frac{4}{5} = 2 + \frac{5}{5}$
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Example:

Problem:

$$= - + + + -$$

$$= (+) + - + -$$

$$=$$