26.1   Subtraction - Worksheet 1

1

Draw a base-10 blocks diagram to represent $31 - 18$ and compute the result.

2

Draw a base-10 blocks diagram to represent $317 - 158$ and compute the result.

3

Think about (do not draw) the diagram you would need to represent $36 - 19$ and compute the result from that mental picture. Did you find the visualization helpful or distracting? Explain what was helpful or distracting about the mental image for you.

The only correct answer to the "helpful or distracting" part of the question is an answer that is true to your own experience.

26.2   Subtraction - Worksheet 2

1

Calculate $57 - 35$ using a number line.

2

Calculate $324 - 158$ using a number line.

3

Think about (do not draw) the number line diagram you would need to calculate $42 - 26$ and compute the result from that mental picture. Do you prefer this visualization or the base-10 blocks visualization? Why?

4

Practice your mental arithmetic by performing the following calculations.

You might be surprised how much a little bit of practice can help to develop your skill and your confidence.

$41 - 27 =$ $\qquad$ $53 - 38 =$ $\qquad$ $39 - 25 =$

$82 - 54 =$ $\qquad$ $67 - 48 =$ $\qquad$ $43 - 37 =$

$344 - 257 =$ $\qquad$ $401 - 235 =$ $\qquad$ $518 - 276 =$

26.3 Subtraction - Worksheet 3

1 Instead of thinking about motion, subtraction can also be thought of as a distance between numbers. Here is a diagram that shows that $7 - 3 = 4$.

$$\boxed{7 - 3 = 4}$$
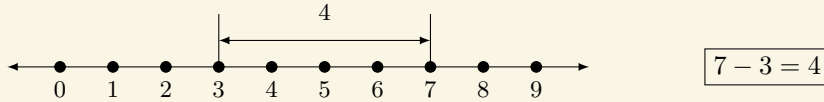
One of the values of this idea is that the distances do not change if you shift both numbers the same amount. This can sometimes allow you to think of the calculation in a slightly different manner that makes it easier to calculate. Here are two calculations where one is just slightly shifted from the other.
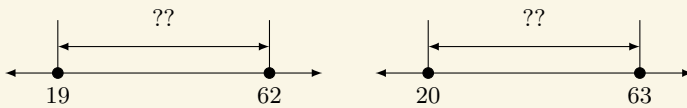
What were the two calculations? Which of the two calculations was easier to do? Why?

2 There are two reasonable ways to calculate $201 - 149$ by shifting the values. Draw the corresponding diagrams and compute the result using both approaches. Which one was easier for you? Why?

3 Practice your mental arithmetic by performing the following calculations.

$49 - 28 =$

$62 - 49 =$

$55 - 37 =$

$199 - 153 =$

$303 - 178 =$

$432 - 285 =$

26.4   Subtraction - Worksheet 4

1

There is a way to leverage your addition experience for doing subtraction problems. It requires reframing the idea of subtraction as solving an addition algebra problem. Notice that the following two equations are equivalent to each other.

$$x = 100 - 48 \qquad\qquad 48 + x = 100$$

The first question asks, "What is the result of subtracting 48 from 100?" The second question asks, "48 plus what number is equal to 100?" While the answers will be the same, they represent two different approaches. We will focus on the second one. Here is a diagram for that question:
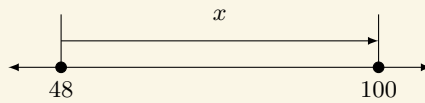
Rather than trying to count down from b by the amount a, this is now about counting up from a to b. The application of this is most common when the b value is a "nice" value to work from. The reason is that it's mentally easier to break it down into different parts using the place values as a guide. Here are two diagrams for $100 - 48$, each showing a different visualization:

Which of the two calculations at the bottom is more intuitive for you?

2

Mentally apply the above method of subtraction to perform the following calculations.

This is sometimes called the "counting up" method.

$100 - 28 =$	$100 - 77 =$	$100 - 31 =$
$150 - 48 =$	$150 - 87 =$	$150 - 95 =$
$300 - 153 =$	$800 - 418 =$	$600 - 238 =$
$1000 - 275 =$	$1000 - 318 =$	$1000 - 444 =$

26.5 Subtraction - Worksheet 5

> **1** In the same way that we used base-8 blocks to visualize addition in base-8, we can use it to help us perform subtraction.

$$33_8 \qquad - \qquad 16_8 \qquad = \qquad 15_8$$
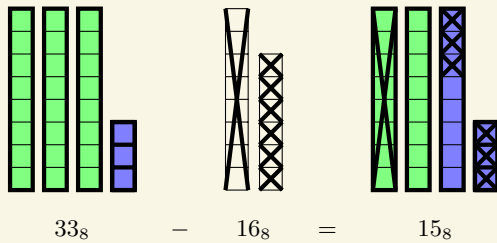
Draw a base-8 blocks diagram to represent $42_8 - 25_8$ and compute the result.

> **2** Draw a base-8 blocks diagram to represent $143_8 - 55_8$ and compute the result.

> **3** Think about (but do not draw) the diagram you would need to represent $52_8 - 33_8$ and compute the result from that mental picture.