



Subtracting Integers

Goal: Subtract integers.

Subtracting Integers

Words To subtract an integer, **add** its opposite.

Numbers $2 - 9 = 2 + (-9) = -7$

$$4 - (-5) = 4 + 5 = 9$$

Algebra $a - b = a + (-b)$

$$a - (-b) = a + b$$

EXAMPLE 1 Subtracting Integers

a. $-49 - (-7) = -49 + 7$
 $= -42$

Add the opposite of -7 .

Add.

b. $-15 - 36 = -15 + (-36)$
 $= -51$

Add the opposite of 36.

Add.

Guided Practice Find the difference.

1. $18 - 57$

2. $-13 - 9$

3. $34 - (-25)$

4. $-62 - (-100)$

EXAMPLE 2 Evaluating an Algebraic ExpressionEvaluate $x - 33 - y$ when $x = 19$ and $y = -41$.

$$x - 33 - y = 19 - 33 - (-41)$$

Substitute 19 for x and -41 for y .

$$= 19 + (-33) - (-41)$$

Add the opposite of 33.

$$= -14 - (-41)$$

Add 19 and -33.

$$= -14 + 41$$

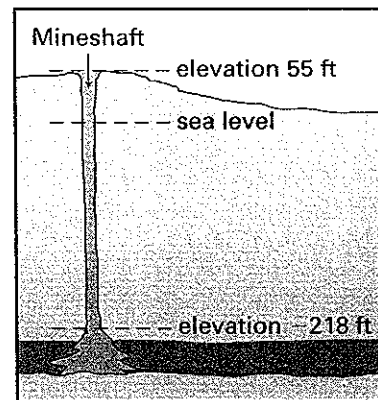
Add the opposite of -41.

$$= 27$$

Add.

EXAMPLE 3 Multiple Choice Practice**Mining** What is the vertical height of the mineshaft?

- (A) -273 feet (B) -163 feet
 (C) 163 feet (D) 273 feet

**Solution**

The vertical height is the difference of the highest and lowest elevations.

$$\text{Vertical height} = 55 - (-218)$$

Write subtraction statement.

$$= 55 + 218$$

Add the opposite of -218.

$$= 273$$

Add.

Answer: The vertical height of the mineshaft is 273 feet. The correct answer is (D). (A) (B) (C) (D)

Guided Practice Complete the following exercises.

<p>5. Evaluate $x - y - 17$ when $x = -53$ and $y = -26$.</p>	<p>6. In Example 3, suppose the lowest elevation of the mine shaft is -149 feet. What is the vertical height of the mineshaft?</p>
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EXAMPLE 4 Multiple Choice Practice

Which two numbers are closest together on a number line?

- (A) 10 and -2
- (B) -13 and 7
- (C) -36 and -10
- (D) 3 and -8

Find the distance between each pair of numbers.

10 and -2 : $|10 - (-2)| = |10 + 2| = |12| = 12$

-13 and 7: $|-13 - 7| = |-13 + (-7)| = |-20| = 20$

-36 and -10 : $|(-36) - (-10)| = |-36 + 10| = |-26| = 26$

3 and -8 : $|3 - (-8)| = |3 + 8| = |11| = 11$

Answer: The smallest distance, 11, is between 3 and -8 . The correct answer is (D).

Guided Practice Find the distance between the two numbers on a number line.

<p>7. 5 and -20</p>	<p>8. 6 and -5</p>
<p>9. -2 and -10</p>	<p>10. -11 and 3</p>

Homework