

LESSON
2-6

Problem Solving
Solving Absolute-Value Equations

Write the correct answer.

- | | |
|---|---|
| <p>1. A machine manufactures wheels with a diameter of 70 cm. It is acceptable for the diameter of a wheel to be within 0.02 cm of this value. Write and solve an absolute-value equation to find the minimum and maximum acceptable diameters.</p> <p>_____</p> <p>_____</p> | <p>2. A pedestrian bridge is 53 meters long. Due to changes in temperature, the bridge may expand or contract by as much as 21 millimeters. Write and solve an absolute-value equation to find the minimum and maximum lengths of the bridge.</p> <p>_____</p> <p>_____</p> |
| <p>3. Two numbers on a number line are represented by the absolute-value equation $n - 5 = 6$. What are the two numbers?</p> <p>_____</p> <p>_____</p> | <p>4. A jewelry maker cuts pieces of wire to shape into earrings. The equation $x - 12.2 = 0.3$ gives the minimum and maximum acceptable lengths of the wires in centimeters. What is the minimum acceptable length of a wire?</p> <p>_____</p> <p>_____</p> |

The table shows the recommended daily intake of several minerals for adult women. Use the table for questions 5–7. Select the best answer.

- | | |
|--|---|
| <p>5. Which absolute-value equation gives the minimum and maximum recommended intakes for zinc?</p> <p>A $x - 8 = 32$ C $x - 16 = 24$</p> <p>B $x - 24 = 16$ D $x - 40 = 32$</p> | <p>6. For which mineral are the minimum and maximum recommended intakes given by the absolute-value equation $x - 31.5 = 13.5$?</p> <p>F Fluoride H Zinc</p> <p>G Iron J None of these</p> |
|--|---|
7. Jason writes an equation for the minimum and maximum intakes of fluoride. He writes it in the form $|x - b| = c$. What is the value of b ?
- A 3 C 6.5
- B 3.5 D 7

| Mineral | Daily Minimum (mg) | Daily Maximum (mg) |
|----------|--------------------|--------------------|
| Fluoride | 3 | 10 |
| Iron | 18 | 45 |
| Zinc | 8 | 40 |

Source:
http://www.supplementquality.com/news/multi_mineral_chart.html

11. {1}

12. {3}

13. two

15. none

$|x - 68| = 3.5$

14. 64.5° ; 71.5°

14. one

16.

10. $|x - 1| = \frac{3}{2}$

Problem Solving

1. $|x - 70| = 0.02$; 69.98 cm; 70.02 cm

2. $|x - 53| = 0.021$; 52.979 m; 53.021 m

3. -1 and 11

4. 11.9 cm

5. B

6. G

7. C

Practice C

1. $\left\{-\frac{3}{5}, \frac{3}{5}\right\}$

2. {0}

3. {-10.5, 10.5}

4. \emptyset

5. {-7, 7}

6. {-11}

7. $\left\{-\frac{3}{2}, \frac{5}{2}\right\}$

8. \emptyset

9. {-6.6, 8.6}

10. {-8, 3}

11. \emptyset

12. \emptyset

13. $|x - 3| = 0.005$; 2.995 m; 3.005 m

14. $|x + 5| = 1.5$; -6.5°C ; -3.5°C

Reading Strategies

1. one

2. two

3. none

4. one

5. none

6. two

Review for Mastery

1. {-6, 10}

2. {-15, 1}

3. {0, 10}

4. {-3, 3}

5. {2}

6. \emptyset

7. \emptyset

8. {-10}

Challenge

1. $|(-3) - 2| = |-5| = 5$; $|7 - 2| = |5| = 5$

2. yes; possible answer:

$|x - 2| + 1 = 6$

3. $|x - 5| = 4$

4. $|x - 2| = 6$

5. $|x - 3| = 8$

6. $|x + 5| = 4$

7. $|x| = \frac{1}{3}$

8. $|x - 5.5| = 0.5$

9. $|x - 2.5| = 7$

LESSON 2-7**Practice A**

1. 20

2. 58 ft/s

3. \$1.05/lb
pages/min

4. 2.5

5. $y = 4$

6. $x = 18$

7. $m = 2$

8. $t = 75$

9. $b = -4$

10. $x = 1$

11. 150 in.

12. 160 mi

Practice B

1. 15

2. \$0.49/lb

3. 0.1 cars/min

4. 46.9 ft/s

5. $y = 5$

6. $x = -0.4$

7. $m = -96$

8. $t = \frac{5}{3}$

9. $b = 20$

10. $x = 3.5$

11. 185 in.

12. 3.7 cm