Chapter 3 Practice Test: Rational Numbers

Multiple Choice
Identify the choice that best completes the statement or answers the question.

____ 1. Order the numbers from least to greatest.
-0.3, $-0.\overline{3}$, -0.33

    a. -0.3, -33, $-0.\overline{3}$ c. -0.33, $-0.\overline{3}$, -0.3

    b. -0.3, $-0.\overline{3}$, -0.33 d. $-0.\overline{3}$, -0.33, -0.3

____ 2. Which numbers below would make this sentence true?
$-5.6 + \square \le -1.5$
i) 4.1
ii) 5.1
iii) 3.7
iv) 4.6

    a. i and iii   b. ii and iv   c. i and iv   d. ii and iii

____ 3. Which expression has the least sum?
i) $9.54 + 6.32$
ii) $-9.54 + 6.32$
iii) $9.54 + (-6.32)$
iv) $-9.54 + (-6.32)$

    a. i   b. ii   c. iv   d. iii

____ 4. Which expressions have the same answer as $-3\frac{2}{3} - (-11)$?

    i) $11 + 3\frac{2}{3}$

    ii) $-11 + 3\frac{2}{3}$

    iii) $-3\frac{2}{3} + 11$

    iv) $11 - 3\frac{2}{3}$

    a. i and ii   b. iii and iv   c. ii and iv   d. i and iii

____ 5. The temperature at the top of a mountain is 10.8°C less than the temperature at the base of the mountain. If the temperature at the base is −4.4°C, what is the temperature at the top?

    a. 6.4°C   b. 15.2°C   c. −15.2°C   d. −6.4°C

____ 6. The price of a share changed by −$1.85. A person owns 120 shares.
By how much did his shares change in value?

    a. +$222.00   b. −$102.00   c. −$222.00   d. −$64.86

_____ 7. Which quotients are less than –1?

   i) $\left(-\dfrac{1}{8}\right) \div \dfrac{1}{7}$

   ii) $\left(-\dfrac{1}{7}\right) \div \dfrac{1}{8}$

   iii) $\dfrac{1}{8} \div \left(-\dfrac{1}{7}\right)$

   iv) $\dfrac{1}{7} \div \left(-\dfrac{1}{8}\right)$

   a. i and iii   b. ii and iv   c. iii and iv   d. i and ii

_____ 8. Which operation would you do first to evaluate this expression?
$8.8 - 1.4 \div 0.2 \times 2.1 + 3.5$
   a. Add 3.5 to 2.1.   c. Subtract 1.4 from 8.8.
   b. Multiply 0.2 by 2.1.   d. Divide 1.4 by 0.2.

_____ 9. Which expression has the greatest value?

   i) $9.1 - 2.7 \times (-1.8)^2$

   ii) $9.1 - [2.7 \times (-1.8)^2]$

   iii) $(9.1 - 2.7) \times (-1.8)^2$

   iv) $9.1 \times (-2.7) \times (-1.8)^2$

   a. iv   b. iii   c. ii   d. i

Short Answer

10. Determine this sum.
$$4\dfrac{1}{8} + \left(-2\dfrac{2}{3}\right)$$

11. Determine a rational number that makes this statement true.
$\square - 12.8 \le -8.2$

12. Determine this product.
$(-5.2)(-15.2)(-18.5)$

13. a) Write a division expression with the same answer as $\dfrac{5}{2} \div \left(-\dfrac{5}{2}\right)$.

   b) Write two multiplication expressions with the same answer as $\dfrac{5}{2} \div \left(-\dfrac{5}{2}\right)$.
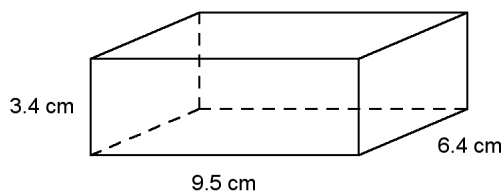
14. Evaluate.

$$\left[\frac{2}{3}+\frac{1}{5}\right]\div\left[\left(-\frac{9}{14}\right)\times\frac{7}{15}\right]$$

Problem

15. Use the numbers in the box below.
    a) List the numbers that are greater than −1.6.
    b) List the numbers that are less than 2.3.

$-\frac{11}{7}$	−0.9	$2\frac{1}{4}$	$2\frac{1}{2}$
	$\frac{10}{3}$	$-1\frac{5}{8}$	$\frac{12}{7}$
1.3	2.45		−1.8

16. a) Predict the sign of (−3.5)(2.5)(−4.4). Explain your reasoning.
    b) Calculate the product. Show your work.

17. At a desert resort, the temperature at 7 a.m. was 3°C.
    The temperature increased by an average of 3.4°C each hour until it reached 30.2°C.
    How long did it take to reach this temperature?

18. The formula for the surface area of a right rectangular prism is given by $A = 2(ab + bc + ac)$,
    where a is its length, b is its width, and c is its height.
    Determine the surface area of this prism.

Chapter 3 Practice Test: Rational Numbers
Answer Section

MULTIPLE CHOICE

1. ANS: D   PTS: 1   DIF: Moderate   REF: 3.1 What Is a Rational Number?
   LOC: 9.N3   TOP: Number   KEY: Conceptual Understanding | Procedural Knowledge
2. ANS: A   PTS: 1   DIF: Difficult   REF: 3.2 Adding Rational Numbers
   LOC: 9.N3   TOP: Number   KEY: Procedural Knowledge
3. ANS: C   PTS: 1   DIF: Moderate   REF: 3.2 Adding Rational Numbers
   LOC: 9.N3   TOP: Number   KEY: Conceptual Understanding
4. ANS: B   PTS: 1   DIF: Easy   REF: 3.3 Subtracting Rational Numbers
   LOC: 9.N3   TOP: Number   KEY: Conceptual Understanding
5. ANS: C   PTS: 1   DIF: Moderate   REF: 3.3 Subtracting Rational Numbers
   LOC: 9.N3   TOP: Number   KEY: Procedural Knowledge | Problem-Solving Skills
6. ANS: C   PTS: 1   DIF: Moderate   REF: 3.4 Multiplying Rational Numbers
   LOC: 9.N3   TOP: Number   KEY: Problem-Solving Skills
7. ANS: B   PTS: 1   DIF: Difficult   REF: 3.5 Dividing Rational Numbers
   LOC: 9.N3   TOP: Number   KEY: Conceptual Understanding
8. ANS: D   PTS: 1   DIF: Easy
   REF: 3.6 Order of Operations with Rational Numbers   LOC: 9.N4
   TOP: Number   KEY: Conceptual Understanding
9. ANS: B   PTS: 1   DIF: Moderate
   REF: 3.6 Order of Operations with Rational Numbers   LOC: 9.N4
   TOP: Number   KEY: Procedural Knowledge

SHORT ANSWER

10. ANS:
    $1\dfrac{11}{24}$

    PTS: 1   DIF: Moderate   REF: 3.2 Adding Rational Numbers
    LOC: 9.N3   TOP: Number   KEY: Procedural Knowledge
11. ANS:
    Any rational number less than or equal to 4.6.

    PTS: 1   DIF: Difficult   REF: 3.3 Subtracting Rational Numbers
    LOC: 9.N3   TOP: Number   KEY: Procedural Knowledge | Problem-Solving Skills
12. ANS:
    -1462.24

    PTS: 1   DIF: Difficult   REF: 3.4 Multiplying Rational Numbers
    LOC: 9.N3   TOP: Number   KEY: Procedural Knowledge

13. ANS:
    Answers may vary. For example:

    a) $\left(-\dfrac{5}{2}\right) \div \dfrac{5}{2}$

    b) $\dfrac{5}{2} \times \left(-\dfrac{2}{5}\right); \left(-\dfrac{5}{2}\right) \times \dfrac{2}{5}$

    PTS: 1   DIF: Moderate   REF: 3.5 Dividing Rational Numbers
    LOC: 9.N3   TOP: Number   KEY: Problem-Solving Skills

14. ANS:
    $-\dfrac{26}{9}$, or $-2\dfrac{8}{9}$

    PTS: 1   DIF: Moderate   REF: 3.6 Order of Operations with Rational Numbers
    LOC: 9.N4   TOP: Number   KEY: Procedural Knowledge

PROBLEM

15. ANS:

    a) $-\dfrac{11}{7}, -0.9, 1.3, \dfrac{12}{7}, 2\dfrac{1}{4}, 2.45, 2\dfrac{1}{2}, \dfrac{10}{3}$

    b) $-1.8, -1\dfrac{5}{8}, -\dfrac{11}{7}, -0.9, 1.3, \dfrac{12}{7}, 2\dfrac{1}{4}$

    PTS: 1   DIF: Moderate   REF: 3.1 What Is a Rational Number?
    LOC: 9.N3   TOP: Number   KEY: Problem-Solving Skills

16. ANS:
    a) $(-3.5)(2.5)$ is negative since the factors have opposite signs.

       So, $(-3.5)(2.5)(-4.4) = \left[(-3.5)(2.5)\right](-4.4)$ is positive since $(-3.5)(2.5)$ and -4.4 are both negative.

    b) $(-3.5)(2.5)(-4.4) = \left[(-3.5)(2.5)\right](-4.4)$

    $$= (-8.75)(-4.4)$$

    $$= 38.5$$

    PTS: 1   DIF: Difficult   REF: 3.4 Multiplying Rational Numbers
    LOC: 9.N3   TOP: Number   KEY: Procedural Knowledge | Communication

17. ANS:
    Temperature change:
    30.2℃ – 3℃ = 27.2℃
    Number of hours the temperature increased:
    27.2℃ ÷ 3.4℃/h = 8 h
    So, it took 8 h to reach 30.2℃.

    PTS: 1   DIF: Moderate   REF: 3.5 Dividing Rational Numbers
    LOC: 9.N3   TOP: Number   KEY: Problem-Solving Skills

18. ANS:
    The surface area of the prism is 229.72 cm^2.

    PTS: 1   DIF: Moderate   REF: 3.6 Order of Operations with Rational Numbers
    LOC: 9.N4   TOP: Number   KEY: Problem-Solving Skills