

# 8 - Exercises - Chapter 1

Name Answer Key  
Hour \_\_\_\_\_

## Lesson 1.1 Practice

## Rational Numbers

Write each fraction or mixed number as a decimal.

1.  $\frac{2}{5}$

0.4

2.  $\frac{3}{10}$

0.3

3.  $\frac{7}{8}$

0.875

4.  $2\frac{16}{25}$

2.64

5.  $-\frac{2}{3}$

-0. $\bar{6}$

6.  $-1\frac{2}{9}$

-1. $\bar{2}$

7.  $6\frac{2}{3}$

6. $\bar{6}$

8.  $-4\frac{3}{11}$

-4. $\overline{27}$

Write each decimal as a fraction or mixed number in simplest form.

9. 0.8

$\frac{4}{5}$

10.  $0.\bar{1}$

$\frac{1}{9}$

11. -2.15

$-2\frac{3}{20}$

## Lesson 1.2 Practice

## Powers and Exponents

Write each expression using exponents.

12.  $8 \cdot 8 \cdot 8 \cdot 8 \cdot 8$

$8^5$

13.  $a \cdot a \cdot a \cdot a \cdot a \cdot a$

$a^6$

14.  $5 \cdot 5 \cdot 9 \cdot 9 \cdot 5 \cdot 9 \cdot 5 \cdot 5$

$5^5 \cdot 9^3$

Evaluate each expression.

15.  $2^4$

16

16.  $(-3)^5$

-243

17.  $(\frac{3}{4})^3$

$\frac{27}{64} = 0.421875$

Evaluate each expression if  $a = 5$  and  $b = 4$ .

18.  $a^2 + b^2$

41

19.  $(a + b)^2$

81

20.  $a + b^2$

21

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## Lesson 1.3 Practice

## Multiply and Divide Monomials

Simplify. Express using exponents.

21.  $5^2 \cdot 5^6$

$5^8$

22.  $e^2 \cdot e^7$

$e^9$

23.  $2a^5 \cdot 6a$

$12a^6$

24.  $4x^2 \cdot (-5x^6)$

$-20x^8$

25.  $\frac{7^9}{7^3}$

$7^6$

26.  $\frac{v^{14}}{v^6}$

$v^8$

27.  $\frac{15w^7}{5w^2}$

$3w^5$

28.  $\frac{10m^8}{2m}$

$5m^7$

29.  $\frac{2^5 \cdot 3^7 \cdot 4^3}{2^1 \cdot 3^5 \cdot 4}$

$2^4 \cdot 3^2 \cdot 4^2$

30.  $\frac{4^{15} \cdot (-5)^6}{4^{12} \cdot (-5)^4}$

$4^3 \cdot (-5)^2$

31.  $\frac{6^7 \cdot 7^6 \cdot 8^5}{6^5 \cdot 7^5 \cdot 8^4}$

$6^2 \cdot 7 \cdot 8$

32.  $\frac{(-3)^6 \cdot 10^5}{(-3)^4 \cdot 10^3}$

$(-3)^2 \cdot 10^2$

## Lesson 1.4 Practice

## Powers of Monomials

Simplify.

33.  $(4^3)^5$

$4^{15}$

34.  $(4^2)^7$

$4^{14}$

35.  $(5q^4r^2)^5$

$3,125q^{20}r^{10}$

36.  $(3y^2z^2)^6$

$729y^{12}z^{12}$

37.  $[(6^2)^2]^2$

$6^8$

38.  $[(3^2)^3]^5$

$3^{30}$

## Lesson 1.5 Practice

## Negative Exponents

Write each expression using a positive exponent.

39.  $6^{-3}$

$\frac{1}{6^3}$

40.  $a^{-8}$

$\frac{1}{a^8}$

42.  $\frac{1}{4^{-5}}$

$4^5$

43.  $\frac{1}{t^{-7}}$

$t^7$

41.  $n^{-4}$

$\frac{1}{n^4}$

44.  $\frac{1}{r^{-10}}$

$r^{10}$

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Evaluate each expression.

45.  $7^{-2}$

$$\frac{1}{49} \approx 0.020408\dots$$

46.  $9^{-3}$

$$\frac{1}{729} \approx 0.001372\dots$$

47.  $(-2)^{-5}$

$$-\frac{1}{32} = -0.03125$$

Write each fraction as an expression using a negative exponent.

48.  $\frac{1}{5^7}$

$$5^{-7}$$

49.  $\frac{1}{3^6}$

$$3^{-6}$$

50.  $\frac{1}{x^8}$

$$x^{-8}$$

Simplify. Express using positive exponents.

51.  $4^{-2} \cdot 4^{-4}$

$$\frac{1}{4^6}$$

52.  $r^{-3} \cdot r^5$

$$r^2$$

53.  $\frac{h^{-2}}{h^4}$

$$\frac{1}{h^6}$$

54.  $\frac{11^8}{11^{-5}}$

$$11^{13}$$

## Lesson 1.6 Practice

## Scientific Notation

Write each number in standard form.

55.  $5.3 \times 10^{12}$

$$5,300,000,000,000$$

56.  $7.07 \times 10^5$

$$707,000$$

57.  $2.6 \times 10^{-3}$

$$0.0026$$

58.  $6.7 \times 10^{-6}$

$$0.0000067$$

Write each number in scientific notation.

59. 561

$$5.61 \times 10^2$$

60. 56,400,000

$$5.64 \times 10^7$$

61. 0.0064

$$6.4 \times 10^{-3}$$

62. 0.000581

$$5.81 \times 10^{-4}$$

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## Lesson 1.7 Practice

## Compute with Scientific Notation

Evaluate each expression. Express the result in scientific notation.

63.  $(6.7 \times 10^4)(2.9 \times 10^5)$

$$1.943 \times 10^{10}$$

65.  $(4.3 \times 10^4) + (5.21 \times 10^5)$

$$5.64 \times 10^5$$

67.  $(9.3 \times 10^{-5})(2.7 \times 10^{-2})$

$$2.511 \times 10^{-6}$$

69.  $(2.7 \times 10^{-3}) + (3.4 \times 10^{-2})$

$$3.67 \times 10^{-2}$$

64.  $\frac{5.46 \times 10^5}{8.4 \times 10^3}$

$$6.5 \times 10$$

66.  $(9.6 \times 10^5) - (3.7 \times 10^3)$

$$9.563 \times 10^5$$

68.  $\frac{8.05 \times 10^4}{2.3 \times 10^{-2}}$

$$3.5 \times 10^6$$

70.  $(7.9 \times 10^{-3}) - (8.4 \times 10^{-5})$

$$7.816 \times 10^{-3}$$

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## Lesson 1.8 Practice

## Roots

Find each square root.

71.  $\sqrt{4}$

$2$

72.  $-\sqrt{49}$

$-7$

73.  $\pm\sqrt{0.01}$

$\pm 0.1$

74.  $\sqrt{\frac{9}{16}}$

$\frac{3}{4} = 0.75$

75.  $\sqrt{-\frac{1}{25}}$

Non-real

76.  $\sqrt{25}$

$5$

Solve each equation. Check your solution(s).

77.  $x^2 = 121$

$x = \pm 11$

78.  $p^2 = \frac{81}{100}$

$p = \pm \frac{9}{10}$  or  $\pm 0.9$

## Lesson 1.9 Reteach

## Estimate Roots

Estimate to the nearest integer.

79.  $\sqrt{8}$

$\approx 3$

80.  $-\sqrt{141}$

$\approx -12$

81.  $\pm\sqrt{14}$

$\approx \pm 4$

82.  $\sqrt[3]{30}$

$\approx 3$

83.  $\sqrt[3]{-750}$

$\approx -9$

84.  $\sqrt[3]{200}$

$\approx 6$

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## Lesson 1.10 Practice

## Compare Real Numbers

Name all sets of numbers to which each real number belongs.

85. 30

Natural  
Whole  
Integer  
Rational

86. -11

Integer  
Rational

87.  $5\frac{4}{7}$

Rational

88. 0

Whole  
Integer  
Rational

89.  $-\sqrt{9}$

Integer  
Rational

90.  $\frac{6}{3}$

Natural  
Whole  
Integer  
Rational

Replace each  $\bullet$  with  $<$ ,  $>$ , or  $=$  to make a true statement.

91.  $2.7 \bullet \sqrt{7}$

$$2.7 > \sqrt{7}$$

92.  $\sqrt{11} \bullet 3\frac{1}{2}$

$$\sqrt{11} < 3\frac{1}{2}$$

93.  $3.\bar{8} \bullet \sqrt{15}$

$$3.\bar{8} > \sqrt{15}$$