

LESSON
4-7**Practice B****Operations with Square Roots****Simplify.**

1. $4\sqrt{5} + 11\sqrt{5}$

2. $12\sqrt{7} - 16\sqrt{7}$

3. $-2\sqrt{3} + 2\sqrt{2} - 6\sqrt{3}$

4. $\sqrt{32} \cdot \sqrt{2}$

5. $\sqrt{5} \cdot 3\sqrt{5}$

6. $\sqrt{24} \cdot 2\sqrt{6}$

7. $\sqrt{32}$

8. $\sqrt{63}$

9. $\sqrt{1200}$

10. $\sqrt{450}$

11. $3\sqrt{28}$

12. $2\sqrt{75}$

13. $\sqrt{28} + 5\sqrt{7}$

14. $\sqrt{72} - \sqrt{128}$

15. $\sqrt{108} + \sqrt{12}$

16. $\sqrt{8} - 15\sqrt{2}$

17. $\sqrt{500} + \sqrt{80}$

18. $\sqrt{12} - \sqrt{8} + \sqrt{18}$

19. The radius of a beach ball is exactly $\sqrt{363}$ inches. Simplify the radius.

20. The length of one side of a square is $\sqrt{24}$ centimeters. What is the perimeter of the square in simplified form?

Challenge

1. A number is divisible by 3 if its digital root is divisible by 3.

Div. by 3	Calculation	Root	Div. by 3
yes	$8 + 1$	9	yes
no	$9 + 2 = 11 \rightarrow 1 + 1$	2	no
no	$2 + 2 + 6 = 10 \rightarrow 1 + 0$	1	no
yes	$3 + 1 + 5$	9	yes
no	$7 + 0 + 4 = 11 \rightarrow 1 + 1$	2	no
no	$1 + 0 + 6 + 4 = 11 \rightarrow 1 + 1$	2	no

2. The digital root of a product of whole numbers equals the product of the digital roots of the factors.

Product	Digital Root of Factor	Digital Root of Factor
187	$1 + 1 = 2$	$1 + 7 = 8$
5082	$1 + 2 + 1 = 4$	$4 + 2 = 6$
8505	$2 + 4 + 3 = 9$	$3 + 5 = 8$
5832	$8 + 1 = 9$	$7 + 2 = 9$
19,440	$3 + 6 + 0 = 9$	$5 + 4 = 9$

Product of Digital Roots of Factors	Digital Root of Product
$2 \times 8 = 16 \rightarrow 1 + 6 = 7$	$1 + 8 + 7 = 16 \rightarrow 1 + 6 = 7$
$4 \times 6 = 24 \rightarrow 2 + 4 = 6$	$5 + 0 + 8 + 2 = 15 \rightarrow 1 + 5 = 6$
$9 \times 8 = 72 \rightarrow 7 + 2 = 9$	$8 + 5 + 0 + 5 = 18 \rightarrow 1 + 8 = 9$
$9 \times 9 = 81 \rightarrow 8 + 1 = 9$	$5 + 8 + 3 + 2 = 18 \rightarrow 1 + 8 = 9$
$9 \times 9 = 81 \rightarrow 8 + 1 = 9$	$1 + 9 + 4 + 4 + 0 = 18 \rightarrow 1 + 8 = 9$

Problem Solving

- | | |
|-----------|-----------------|
| 1. 336 km | 2. 281 km |
| 3. 5 km | 4. up to 226 km |
| 5. C | 6. F |
| 7. D | 8. G |

Reading Strategies

- | | |
|---------------------|-------|
| 1. 4 | 2. 4 |
| 3. 5 | 4. 5 |
| 5. 100 | 6. 10 |
| 7. 81 | 8. 9 |
| 9. between 9 and 10 | |

Puzzles, Twisters & Teasers

- | | |
|-------|-------|
| S. 6 | R. 12 |
| P. 10 | T. 8 |
| G. 5 | I. 3 |
| W. 2 | H. 13 |
| E. 9 | U. 7 |
| L. 11 | |

P U L L

T H E I R L E G S

LESSON 4-7

Practice A

- | | |
|--|--------------------------------|
| 1. $11\sqrt{2}$ | 2. $4\sqrt{5}$ |
| 3. $9\sqrt{7}$ | 4. $\sqrt{16}; 4$ |
| 5. $3\sqrt{100}; 3 \cdot 10; 30$ | 6. $5\sqrt{81}; 5 \cdot 9; 45$ |
| 7. $\sqrt{9} \cdot \sqrt{5}; 3 \cdot \sqrt{5}; 3\sqrt{5}$ | |
| 8. $\sqrt{16} \cdot \sqrt{2}; 4 \cdot \sqrt{2}; 4\sqrt{2}$ | |
| 9. $10\sqrt{3}; \sqrt{300}$ | |
| 10. $\sqrt{9} \cdot \sqrt{3} + \sqrt{16} \cdot \sqrt{3}; 3\sqrt{3} + 4\sqrt{3}; 7\sqrt{3}$ | |
| 11. $2\sqrt{2}$ | 12. $9\sqrt{3}$ |
| 13. $11\sqrt{2}$ ft | 14. $\sqrt{5}$ cm |

Practice B

- | | |
|-----------------|-----------------|
| 1. $15\sqrt{5}$ | 2. $-4\sqrt{7}$ |
|-----------------|-----------------|

3. $-8\sqrt{3} + 2\sqrt{2}$
5. 15
7. $4\sqrt{2}$
9. $20\sqrt{3}$
11. $6\sqrt{7}$
13. $7\sqrt{7}$
15. $8\sqrt{3}$
17. $14\sqrt{5}$
19. $11\sqrt{3}$ inches
20. $8\sqrt{6}$ centimeters

Practice C

1. $37\sqrt{3}$
3. $2\sqrt{11} - 15\sqrt{7}$
5. -26
7. $6\sqrt{3}$
9. $-4\sqrt{10}$
11. $6\sqrt{14}$
13. $26\sqrt{5}$
15. $80\sqrt{2}$
17. $2\sqrt{3} - \sqrt{2}$
19. $4\sqrt{7}$ cm
2. $-4\sqrt{15}$
4. 14
6. 90
8. $3\sqrt{6}$
10. $10\sqrt{6}$
12. $175\sqrt{2}$
14. $-2\sqrt{3}$
16. $8\sqrt{6}$
18. $-3\sqrt{5}$
20. 48 in.

Review for Mastery

1. $11\sqrt{2}$
3. $8\sqrt{5}$
5. 2
7. 12
9. $3\sqrt{5}$
11. $10\sqrt{6}$
2. $7\sqrt{6}$
4. $9\sqrt{10}$
6. 20
8. 24
10. $2\sqrt{3}$
12. $15\sqrt{2}$

Challenge

1. 2
3. -1
5. $\sqrt[3]{12}$
2. 4
4. 10
6. 5

7. 20
9. $2\sqrt[3]{2}$
11. $2\sqrt[3]{5}$
8. 3
10. $4\sqrt[3]{2}$
12. $5\sqrt[3]{4}$

Problem Solving

1. $6\sqrt{5}$ feet
2. $8\sqrt{3}$ miles
3. $11\sqrt{15}$ miles
4. $2\sqrt{3}$ centimeters
5. B
6. H
7. B

Reading Strategies

1. $2\sqrt{6}$
3. $2\sqrt{3}$
5. $\sqrt{21}$
2. $3\sqrt{6}$
4. $3\sqrt{3}$
6. $3\sqrt{7}$

Puzzles, Twisters & Teasers

1. $5\sqrt{5}$
3. $-7\sqrt{3}$
5. $8\sqrt{10}$
7. $11\sqrt{10}$
9. $-26\sqrt{2}$
2. -84
4. $5\sqrt{6}$
6. 60
8. $-6\sqrt{11}$
10. 0

HER ROOTS WERE SHOWING

LESSON 4-8

Practice A

1. rational; real
3. irrational; real
5. integer; rational; real
7. rational
9. not real
11. rational
13. rational
2. rational; real
4. natural; whole; integer; rational; real
6. natural; whole; integer; rational; real
8. irrational
10. not real
12. rational
14. irrational