

Lesson 7.1

Unit 7 Homework Key

Identify which of the following numbers are rational or irrational.

1. $\sqrt{25}$

Rational

2. $\sqrt{24}$

Irrational

3. $-\sqrt{36}$

Rational

4. $-\sqrt{64}$

Rational

5. $-\sqrt{27}$

Irrational

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

Rational

7. 0.45

Rational

8. $0.\bar{2}$

Rational

9. $\sqrt{49}$

Rational

10. $\sqrt{18}$

Irrational

11. $-\sqrt{10}$

Irrational

12. $\frac{11}{21}$

Rational

13. $\frac{2}{13}$

Rational

14. $0.\overline{42}$

Rational

15. 0.39

Rational

16. $-\sqrt{100}$

Rational

17. $-\sqrt{16}$

Rational

18. $-\sqrt{43}$

Irrational

19. If the number 0.77 is displayed on a calculator that can only display ten digits, do we know whether it is rational or irrational? In one complete sentence explain why.

Rational because it terminates (or repeats the digit zero).

20. If the number 0.123456789 is displayed on a calculator that can only display ten digits, do we know whether it is rational or irrational? In one complete sentence explain why.

We don't know. The decimal could repeat later making it rational or could never repeat making it irrational.

21. If the number 0.987098709 is displayed on a calculator that can only display ten digits, do we know whether it is rational or irrational? In one complete sentence explain why.

Our best guess is that it is rational because there appears to be a pattern, but we can't be sure.

22. If the number 0.425364758 is displayed on a calculator that can only display ten digits, do we know whether it is rational or irrational? In one complete sentence explain why.

We don't know. The decimal could repeat later making it rational or could never repeat making it irrational.

Lesson 7.2

Convert the following fractions to repeating decimals.

1. $\frac{7}{15}$

$0.4\bar{6}$

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

$0.\bar{6}$

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

$0.\bar{7}$

4. $\frac{10}{33}$

$0.\overline{30}$

5. $\frac{1}{9}$

$0.\bar{1}$

6. $\frac{2}{11}$

$0.\overline{18}$

7. $\frac{11}{12}$

$0.91\bar{6}$

8. $\frac{1}{3}$

$0.\bar{3}$

9. $\frac{5}{6}$

$0.8\bar{3}$

10. $\frac{5}{11}$

$0.\overline{45}$

11. $\frac{1}{6}$

$0.1\bar{6}$

12. $\frac{7}{18}$

$0.3\bar{8}$

Convert the following repeating decimals to fractions.

13. $0.\bar{2}$

$\frac{2}{9}$

14. $0.1\bar{5}$

$\frac{7}{45}$

15. $0.3\bar{6}$

$\frac{11}{30}$

16. $0.4\bar{8}$

$\frac{22}{45}$

17. $1.2\bar{3}$

$\frac{37}{30}$ or $1\frac{7}{30}$

18. $1.\bar{5}$

$\frac{14}{9}$ or $1\frac{5}{9}$

19. $0.\overline{81}$

$\frac{9}{11}$

20. $0.\overline{35}$

$\frac{35}{99}$

21. $0.2\overline{15}$

$\frac{71}{330}$

22. $0.1\overline{23}$

$\frac{61}{495}$

23. $1.\overline{16}$

$\frac{115}{99}$ or $1\frac{16}{99}$

24. $3.\overline{25}$

$\frac{322}{99}$ or $3\frac{25}{99}$

Lesson 7.3

Find both square roots of the given numbers.

1. 49

± 7

2. 64

± 8

3. 25

± 5

4. 16

± 4

5. 1

± 1

6. 121

± 11

7. 9

± 3

8. 196

± 14

9. 625

± 25

10. 4

± 2

11. 36

± 6

12. 81

± 9

Evaluate the following roots giving the principal root.

13. $\sqrt{81}$

9

14. $-\sqrt{100}$

-10

15. $\sqrt{36}$

6

16. $\sqrt{-4}$

no solution

17. $\sqrt{144}$

12

18. $-\sqrt{225}$

-15

19. $-\sqrt{169}$

-13

20. $\sqrt{400}$

20

21. $-\sqrt{900}$

-30

22. $\sqrt[3]{-27}$

-3

23. $\sqrt[3]{125}$

5

24. $\sqrt[3]{1}$

1

25. $\sqrt[3]{-1}$

-1

26. $\sqrt[3]{-64}$

-4

27. $\sqrt[3]{216}$

6

28. $\sqrt[3]{8}$

2

29. $\sqrt[3]{-1000}$

-10

30. $\sqrt[3]{27}$

3

31. $-\sqrt[3]{27}$

-3

32. $-\sqrt[3]{1}$

-1

Approximate the following irrational numbers to the nearest whole number.

33. $\sqrt{28}$	34. $\sqrt{14}$	35. $-\sqrt{39}$	36. $-\sqrt{56}$	37. $-\sqrt{77}$	38. $\sqrt{18}$
≈ 5	≈ 4	≈ -6	≈ -7	≈ -9	≈ 4

39. $\sqrt{2}$	40. $\sqrt{41}$	41. $\sqrt{21}$	42. $-\sqrt{65}$	43. $-\sqrt{12}$	44. $-\sqrt{120}$
≈ 1	≈ 6	≈ 5	≈ -8	≈ -3	≈ -11

45. $\sqrt{8}$	46. $\sqrt{13}$	47. $\sqrt{32}$	48. $\sqrt{47}$	49. $-\sqrt{99}$	50. $-\sqrt{5}$
≈ 3	≈ 4	≈ 6	≈ 7	≈ -10	≈ -2

Approximate the following irrational numbers to one decimal place.

51. $\sqrt{30}$	52. $\sqrt{10}$	53. $-\sqrt{40}$	54. $-\sqrt{17}$	55. $\sqrt{101}$	56. $\sqrt{7}$
≈ 5.5	≈ 3.2	≈ -6.3	≈ -4.1	≈ 10.0	≈ 2.6

57. $\sqrt{3}$	58. $\sqrt{90}$	59. $\sqrt{35}$	60. $-\sqrt{11}$	61. $-\sqrt{22}$	62. $\sqrt{61}$
≈ 1.7	≈ 9.5	≈ 5.9	≈ -3.3	≈ -4.7	≈ 7.8

63. $\sqrt{50}$	64. $\sqrt{6}$	65. $\sqrt{67}$	66. $\sqrt{140}$	67. $-\sqrt{55}$	68. $-\sqrt{45}$
≈ 7.1	≈ 2.4	≈ 8.2	≈ 11.8	≈ -7.4	≈ -6.7

Lesson 7.4

Place a point on the number line given for each of the following irrational numbers.

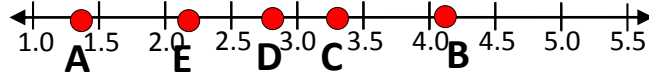
1. Point A: $\sqrt{2}$

2. Point B: $\sqrt{17}$

3. Point C: $\sqrt{11}$

4. Point D: $\sqrt{8}$

5. Point E: $\sqrt{5}$



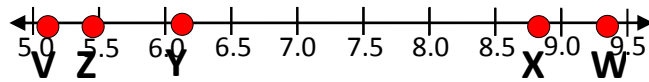
6. Point V: $\sqrt{26}$

7. Point W: $\sqrt{88}$

8. Point X: $\sqrt{77}$

9. Point Y: $\sqrt{37}$

10. Point Z: $\sqrt{30}$



Name the point on the number line associated with each irrational number.

11. $\sqrt{50}$

12. $\sqrt{103}$

13. $\sqrt{62}$

14. $\sqrt{90}$

15. $\sqrt{37}$

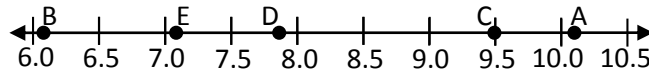
E

A

D

C

B



16. $\sqrt{7}$

17. $\sqrt{22}$

18. $\sqrt{34}$

19. $\sqrt{38}$

20. $\sqrt{15}$

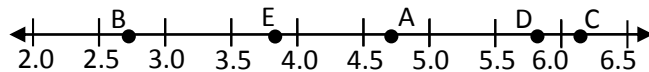
B

A

D

C

E



Compare the following numbers using < or >.

21. $\sqrt{32} \boxed{>} 5.1$

22. $\sqrt{38} \boxed{<} \sqrt{42}$

23. $\sqrt{17} \boxed{<} \frac{9}{2}$

24. $\sqrt{49} \boxed{<} 7.1$

25. $\sqrt{99} \boxed{>} \frac{28}{3}$

26. $\sqrt{17} \boxed{<} 4.5$

27. $\frac{43}{5} \boxed{>} \sqrt{65}$

28. $\sqrt{12} \boxed{<} \sqrt{21}$

29. $\sqrt{16} \boxed{>} 3.9$

30. $\sqrt{2} \boxed{<} \frac{7}{4}$

31. $\sqrt{50} \boxed{<} \frac{15}{2}$

32. $\sqrt{9} \boxed{<} 3.01$

List the following numbers in order from least to greatest.

33. $\sqrt{16}, 4.2, \frac{39}{8}$

34. $\sqrt{24}, \sqrt{33}, 5.1$

$\sqrt{16}, 4.2, \frac{39}{8}$

$\sqrt{24}, 5.1, \sqrt{33}$

35. $\sqrt{100}, \sqrt{110}, \frac{32}{7}$

36. $9.4, \frac{19}{2}, \sqrt{80}$

$\frac{32}{7}, \sqrt{100}, \sqrt{110}$

$\sqrt{80}, 9.4, \frac{19}{2}$

37. $\sqrt{35}, \sqrt{32}, \sqrt{37}, \frac{22}{3}$

38. $\sqrt{10}, 3.5, \sqrt{15}, \frac{13}{3}$

$\sqrt{32}, \sqrt{35}, \sqrt{37}, \frac{22}{3}$

$\sqrt{10}, 3.5, \sqrt{15}, \frac{13}{3}$

39. $\sqrt{65}, \sqrt{60}, 8.5, \frac{37}{4}$

40. $\sqrt{39}, \sqrt{25}, 5.3, \sqrt{26}, \frac{23}{4}$

$\sqrt{60}, \sqrt{65}, 8.5, \frac{37}{4}$

$\sqrt{25}, \sqrt{26}, 5.3, \frac{23}{4}, \sqrt{39}$

41. $\sqrt{12}, \sqrt{15}, 4.3, \sqrt{9}, \frac{14}{5}$

42. $\sqrt{49}, \sqrt{63}, 7.3, \sqrt{38}, \frac{15}{2}$

$\frac{14}{5}, \sqrt{9}, \sqrt{12}, \sqrt{15}, 4.3$

$\sqrt{38}, \sqrt{49}, 7.3, \frac{15}{2}, \sqrt{63}$

Lesson 7.5

Estimate the following expressions to the nearest whole number.

1. $\sqrt{8} + \sqrt{18}$

≈ 7

2. $11 - \sqrt{80}$

≈ 2

3. $4\sqrt{48}$

≈ 28

4. $3\sqrt{24} + 3$

≈ 18

5. $2\sqrt{35} - 3\sqrt{8}$

≈ 3

6. $\sqrt{14} + \sqrt{26}$

≈ 9

7. $\sqrt{120} - 7$

≈ 4

8. $2\sqrt{63}$

≈ 16

9. $4\sqrt{15} - 5$

≈ 11

10. $2\sqrt{66} - 3\sqrt{5}$

≈ 10

11. $\sqrt{9} + \sqrt{10}$

≈ 6

12. $20 - \sqrt{102}$

≈ 10

13. $2\sqrt{15}$

≈ 8

14. $3\sqrt{15} + 1$

≈ 13

15. $4\sqrt{24} - 3\sqrt{3}$

≈ 14

16. $\sqrt{14} + \sqrt{34}$

≈ 10

17. $\sqrt{105} - 9$

≈ 1

18. $5\sqrt{26}$

≈ 25

19. $2\sqrt{83} - 8$

≈ 10

20. $3\sqrt{17} - 2\sqrt{1}$

≈ 10

21. $\sqrt{47} + \sqrt{8}$

≈ 10

22. $8 - \sqrt{48}$

≈ 1

23. $7\sqrt{10}$

≈ 21

24. $4\sqrt{5} + 9$

≈ 17

25. $3\sqrt{24} - 5\sqrt{5}$

≈ 5

26. $\sqrt{65} + \sqrt{63}$

≈ 16

27. $\sqrt{100} - 2$

$= 8$

28. $6\sqrt{5}$

≈ 12

29. $2\sqrt{26} - 3$

≈ 7

30. $4\sqrt{26} - 3\sqrt{4}$

≈ 14