Common Core Quick Check — Use with Lesson 10 Standard 8.NS.2

Estimate to the nearest whole number.

1. $\sqrt{39}$
2. $\sqrt{102}$ → ±10.0995.... → 10 or −10
3. $\sqrt{71.3}$
4. $\sqrt{25.9}$
5. Give two numbers that have square roots between 9 and 10. 81 → 100 83 85 96 98.6 89 82 91.01
6. **TEST PRACTICE** Which of the following is in order from least to greatest?
   - A. $7, \sqrt{52}, 8, \sqrt{62}, \sqrt{67}$
   - B. $7, \sqrt{52}, \sqrt{62}, 8, \sqrt{67}$
   - C. $\sqrt{52}, 7, \sqrt{62}, 8, \sqrt{67}$
   - D. $7, \sqrt{52}, \sqrt{67}, \sqrt{62}, 8$

Chapter 1 • Real Numbers — Glencoe Math, Course 3

$\cancel{-3 \cdot -3} \cdot -3$ 9

7) $\sqrt[3]{-27} = -3$

$\sqrt[3]{\boxed{\wedge}}$ 3, 2nd, ^, -27

$\sqrt{-27}$ Error

Sep 20-10:30 AM

ANSWERS

1. 6
2. 10
3. 8
4. 5
5. Sample answer: 82, 87
6. B

Sep 20-10:36 AM

Lab:

1. Finish the I Ready Diagnostic
2. Log on to Prodigy. If you are not part of my Prodigy class, there is a code on my Google Classroom.
3. There is also an exponent review game link on Google Classroom that you can play if you finish the diagnostic early.

Sep 25-7:36 AM

yesterday's homework answers:

NAME ________ DATE ________ PERIOD ________

Lesson 8 Homework Practice

Roots $\boxed{(-)}\boxed{2^{nd}}\boxed{x^2}\boxed{144}$

Find each root. Cube root $\sqrt[x]{\ }$

1. $\sqrt{36}$ 6 — 6 or −6 — 6·6=36 −6·−6=36
2. $-\sqrt{144}$ −12
3. $\sqrt[3]{\frac{27}{64}}$ $\frac{3}{4}$
4. $\sqrt[3]{2{,}744}$ 14 $\boxed{3}\boxed{2^{nd}}\boxed{\wedge}\boxed{2744}$
5. $\pm\sqrt{2.25}$ ±1.5
6. $\pm\sqrt{\frac{121}{289}}$ $\pm\frac{11}{17}$
7. $\sqrt{\frac{-81}{100}}$ no real solution
8. $\pm\sqrt{0.0025}$ ±0.05
9. $-\sqrt{0.49}$ −0.7
10. $-\sqrt{3.24}$ −1.8
11. $-\sqrt{\frac{25}{441}}$ $-\frac{5}{21}$
12. $\pm\sqrt{361}$ ±19 — 19 and −19

ALGEBRA Solve each equation. Check your solution(s).

13. $\sqrt{h^2} = \sqrt{121}$ 11 or −11
14. $\sqrt{324} = \sqrt{a^2}$ 18 or −18
15. $x^2 = \frac{81}{169}$ $\frac{9}{13}$ or $-\frac{9}{13}$
16. $0.0196 = m^2$ 0.14 or −0.14
17. $\cancel{\sqrt{y}}^2 = 6^2$ 36 — y=36
18. $\sqrt{z}^2 = 8.4^2$ 70.56 — Square both side.

19. GARDENING Moesha has 196 pepper plants that she wants to plant in square formation. How many pepper plants should she plant in each row? **14 plants** $\sqrt{196} = 14$
20. RESTAURANTS A new restaurant has ordered 64 tables for its outdoor patio. If the manager arranges the tables in a square formation, how many will be in each row? **8 tables**

GEOMETRY The formula for the perimeter of a square is $P = 4s$, where s is the length of a side. Find the perimeter of each square.

21. Area = 144 square inches — 12, 12, 12, 12 — $\sqrt{144} = 12$ — P = 48 in.
22. Area = 81 square feet — 9, 9, 9, 9 — $\sqrt{81} = 9$ — P = 36 ft
23. Area = 324 square meters — 72 m

Sep 20-1:14 PM

Independent Practice — Go online for Step-by-Step Solutions

yesterday's textbook (optional) answers:

Find each square root. (Examples 1–4)

1. $\sqrt{16} = 4$ — $4^2 = 16$ so $\sqrt{16} = 4$ $\boxed{(-)}\boxed{2^{nd}}\boxed{x^2}$ 484 enter
2. $-\sqrt{484} = -22$
3. $\sqrt{-36} =$ no real solution "ERROR"
4. $\pm\sqrt{\frac{9}{49}} = \pm\frac{3}{7}$ → $\frac{3}{7}$ or $-\frac{3}{7}$ — $\frac{\sqrt{9}}{\sqrt{49}}$ $\frac{3}{7}$ $\frac{3 \cdot 3}{7 \cdot 7}$ $\frac{9}{49}$
5. $-\sqrt{2.56} = -1.6$
6. $\sqrt{-0.25} =$ no real solution "ERROR"

Solve each equation. Check your solution(s). (Example 5)

7. $v^2 = 81$ ±9 — $\sqrt{81}$ 9 or −9
8. $w^2 = \frac{36}{100}$ $\pm\frac{3}{5}$ — $\frac{\sqrt{36}}{\sqrt{100}}$ → $\frac{6}{10}$
9. $0.0169 = c^2$ ±0.13 — $\sqrt{.0169}$

Find each cube root. (Examples 6 and 7)

10. $\sqrt[3]{1{,}728} = 12$ — $\sqrt[3]{1728}$
11. $\sqrt[3]{-0.125} = -0.5$
12. $\sqrt[3]{\frac{27}{125}} = \frac{3}{5}$
13. A group of 169 students needs to be seated in a square formation for a yearbook photo. Solve the equation $169 = s^2$ to find how many students should be in each row. (Example 8) **13 students**

May 14-8:26 AM

yesterday's textbook (optional) answers:

Persevere with Problems Given the area of each square, find the perimeter.

15. Area = 121 square inches — 44 in.
16. Area = 25 square feet — 20 ft — 5ft, 5, 5 — P= — $5\sqrt{25} = 5$
17. Area = 36 square meters — 24 m

H.O.T. Problems Higher Order Thinking

Persevere with Problems Find each value.

18. $(\sqrt{36})^2 = 36$
19. $\left(\sqrt{\frac{25}{81}}\right)^2 = \frac{25}{81}$
20. $(\sqrt{199})^2 = 199$
21. $(\sqrt{x})^2 = x$

May 14-8:27 AM

yesterday's textbook (optional) answers:

22. Construct an Argument Explain why the square root of 64 has a positive and a negative value. Sample answer: To find the square root of 64, look for two equal numbers that give an answer of 64 as a product: 8 · 8 = 64 and −8 · −8 = 64.

Standardized Test Practice

23. The area of each square is 16 square units. Find the perimeter of the figure.
- Ⓐ 16 units
- Ⓑ 32 units
- Ⓒ 40 units
- Ⓓ 48 units

Standardized Test Practice

42. A marching band wants to form a square in the middle of the field. If there are 100 members in the band, how many should be in each row?
- Ⓐ 4
- Ⓑ 25
- Ⓒ 10
- Ⓓ 50

43. Mr. Freeman's farm has a square cornfield. Find the area of the cornfield if the sides are measured in whole numbers.
- Ⓕ 164,000 ft²
- Ⓖ 170,150 ft²
- Ⓗ 170,586 ft²
- Ⓘ 174,724 ft²

44. Short Response A puzzle cube is shown. The volume of the cube is 512 cubic centimeters. What is the length of one side of the puzzle cube? 8 cm

Find each square root.

24. $-\sqrt{81} = -9$ $9 \cdot 9 = 81$ So, $-\sqrt{81} = -9$.
25. $-\sqrt{\frac{64}{225}} = -\frac{8}{15}$
26. $-\sqrt{\frac{16}{25}} = -\frac{4}{5}$
27. $\pm\sqrt{1.44} = \pm 1.2$

Find each cube root.

28. $\sqrt[3]{-216} = -6$
29. $\sqrt[3]{-512} = -8$
30. $\sqrt[3]{-1{,}000} = -10$
31. $\sqrt[3]{-343} = -7$

Solve each equation. Check your solution(s).

32. $b^2 = 100$ ± 10
33. $\frac{9}{64} = c^2$ $\pm\frac{3}{8}$
34. $a^2 = 1.21$ ± 1.1
35. $\frac{1}{8} = z^3$ $\frac{1}{2}$
36. $1.331 = c^3$ 1.1
37. $m^3 = 8{,}000$ 20
38. $\sqrt{x} = 5$ 25
39. $\sqrt{y} = 20$ 400
40. $\sqrt{z} = 10.5$ 110.25

Common Core Review

Evaluate each expression. 8.EE.2

45. $13^3 = 2{,}197$
46. $25^2 = 625$
47. $15^3 = 3{,}375$
48. $34^2 = 1{,}156$
49. $5 \cdot \sqrt{121} = 55$
50. $-6 \cdot \sqrt{36} = -36$
51. $10 \cdot \sqrt[3]{8} = 20$
52. $-4 \cdot \sqrt{144} = -48$

Express the volume of each cube as a monomial. 8.EE.1

53. $4r^3s$ $64r^9s^3$ units³
54. $9m^2n^4$ $729m^6n^{12}$ units³

May 14-8:27 AM

Chart with Powers of 10:

Table – Powers of 10					Scientific Notation	
Name	Prefix	Decimal	Exponential	Normalized	E Notation
septillion	yotta	1,000,000,000,000,000,000,000,000	10^{24}	1.0×10^{24}	1.0E24
sextillion	zetta	1,000,000,000,000,000,000,000	10^{21}	1.0×10^{21}	1.0E21
quintillion	exa	1,000,000,000,000,000,000	10^{18}	1.0×10^{18}	1.0E18
quadrillion	peta	1,000,000,000,000,000	10^{15}	1.0×10^{15}	1.0E15
trillion	tera	1,000,000,000,000	10^{12}	1.0×10^{12}	1.0E12
billion	giga	1,000,000,000	10^{9}	1.0×10^{9}	1.0E9
million	mega	1,000,000	10^{6}	1.0×10^{6}	1.0E6
thousand	kilo	1,000	10^{3}	1.0×10^{3}	1.0E3
hundred	hector	100	10^{2}	1.0×10^{2}	1.0E2
ten	deca	10	10^{1}	1.0×10^{1}	1.0E1
one	(none)	1	10^{0}	1.0×10^{0}	1.0E0
tenth	deci	0.1	10^{-1}	1.0×10^{-1}	1.0E-1
hundredth	centi	0.01	10^{-2}	1.0×10^{-2}	1.0E-2
thousandth	milli	0.001	10^{-3}	1.0×10^{-3}	1.0E-3
millionth	micro	0.000001	10^{-6}	1.0×10^{-6}	1.0E-6
billionth	nano	0.000000001	10^{-9}	1.0×10^{-9}	1.0E-9
trillionth	pico	0.000000000001	10^{-12}	1.0×10^{-12}	1.0E-12
quadrillionth	femto	0.000000000000001	10^{-15}	1.0×10^{-15}	1.0E-15
quintillionth	atto	0.000000000000000001	10^{-18}	1.0×10^{-18}	1.0E-18
sextillionth	zepto	0.000000000000000000001	10^{-21}	1.0×10^{-21}	1.0E-21
septillionth	yocto	0.000000000000000000000001	10^{-24}	1.0×10^{-24}	1.0E-24

Sep 22-9:54 AM

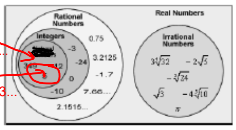
Notes:

Words	Rational Number	Irrational Number
	A rational number is a number that can be converted into a fraction.	An irrational number *cannot* be converted into a fraction.
Examples	$-2, 5, 3.\overline{76}, -12\frac{7}{8}$	$\sqrt{2} \approx 1.414213562\ldots$

Numbers that are not rational are called irrational numbers. The square root of any number that is not a perfect square number is irrational. The set of rational numbers and the set of irrational numbers together make up the set of **real numbers**. Study the Venn Diagram below.

whole numbers: 0,1,2...

natural numbers: 1,2,3...



*The diagram on the last page of the packet is much easier to read!

Examples

Determine if the expression is rational or irrational. If it is a rational number prove so by converting it into a fraction. If it is an irrational number approximate its decimal value to the nearest hundredth.

1) 0.2525 ... The decimal ends in a repeating pattern. Repeating patterns can always be converted into a fraction. This number is rational because it is equivalent to the ratio $\frac{25}{99}$.

Sep 22-9:54 AM

Notes:

1) $\sqrt{36} = 6$ or -6 Rational Integer — Since $\sqrt{36} = 6$, it is rational because 6 can be written as the fraction $\frac{6}{1}$

$x = 0.2525\ldots$
$100x = 25.2525$
$-\quad x = 0.2525$
$99x = 25$
$/99 \quad /99$
$x = \frac{25}{99}$

2) $-\sqrt{7}$ Irrational — $-\sqrt{7} = -2.645751311\ldots$ The decimal does not terminate nor repeat, so it is an irrational number. This number cannot be written as a fraction.

Got It?

a) $\sqrt{10}$ b) $-2\frac{2}{5}$ c) $\sqrt{100}$

We can understand irrational numbers if we approximate them on a number line. All numbers can be placed on a number line. To find the location of an irrational number on a number line, you need to use a rational approximation.

Examples

3) Find the approximate location of $\sqrt{12}$ on a number line.

$\sqrt{12} = 3.46$

1	2	3	4	5	6	7	8	9	10
$\sqrt{1}$	$\sqrt{4}$	$\sqrt{9}$	$\sqrt{16}$	$\sqrt{25}$	$\sqrt{36}$	$\sqrt{49}$	$\sqrt{64}$	$\sqrt{81}$	$\sqrt{100}$

Step 1: Identify the two closest integer values. *Memorizing the perfect square values will make this process easier.*

Step 2: Determine which integer the value is closest to by determining which perfect square $\sqrt{12}$ is closer to

Got It?

d) Find the approximate location of $\sqrt{26}$ on the number line.

5   5.1   5.2   5.3   5.4   5.5   5.6   5.7   5.8   5.9   6

Sep 22-9:55 AM

Notes:

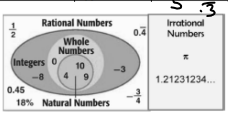
Key Concept Real Number System

Natural	Whole	Integer	Rational	Irrational
The counting numbers; 1,2,3 . . .	The counting numbers and 0; 0,1,2. . .	The whole numbers and their opposites; −2	Integers, all +/ − fractions, repeating decimals; −1.2	Decimals that do not repeat; $\sqrt{35}$

and go on forever. They cannot be converted to fractions. Think "Crazy" numbers.

5 .3

5.5160907. . . .



Examples

Name all the sets to which each real number belongs.

4) 0.2525 ... The decimal ends in a repeating pattern. Repeating patterns can be converted into a fraction. It is a rational number because it is equivalent to $\frac{25}{99}$.

5) $\sqrt{36}$ Since $\sqrt{36} = 6$, it is a natural number, a whole number, an integer, and a rational number. It is rational because 6 can be written as the fraction $\frac{6}{1}$

6) $-\sqrt{7}$ $-\sqrt{7} = -2.645751311\ldots$ The decimal does not terminate nor repeat, so it is an irrational number. This number cannot be written as a fraction.

Got It?

a) $\sqrt{10}$ Irrational (put square root of 10 in the calculator first)

b) $-2\frac{2}{5}$ rational

c) $\sqrt{100} = 10$ =10, so it's rational, an integer, whole, natural

Sep 22-9:55 AM

Lesson 10

Compare Real Numbers

p89

What You'll Learn

Scan the lesson. Write the definitions of irrational number and real number. Sample answers:

Objective:

I can compare, classify, and order real numbers

irrational number—a number that is not rational

real number—the sets of rational numbers and irrational numbers combined

Essential Question

WHY is it helpful to write numbers in different ways?

Vocabulary

irrational number
real number

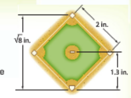
Common Core State Standards

Content Standards
8.NS.1, 8.NS.2, 8.EE.2

Mathematical Practices
1, 3, 4, 6

Real-World Link

Sports Major League baseball has rules for the dimensions of the baseball diamond. A model of the diamond is shown.



1. On the model, the distance from the pitching mound to home plate is 1.3 inches. Is 1.3 a rational number? Explain.
   Yes; it can be written as $\frac{13}{10}$.
2. On the model, the distance from first base to second base is 2 inches. Is 2 a rational number? Explain.
   Yes; it can be written as $\frac{2}{1}$.
3. The distance from home plate to second base is $\sqrt{8}$ inches. Using a calculator, find $\sqrt{8}$. Does it appear to terminate or repeat?
   2.828427125; Sample answer: It does not repeat. It appears to terminate.
4. To determine if the number terminates, on your calculator, multiply your answer to $\sqrt{8}$ by itself. Do not use the x^2 button.
   Is the answer 8? no
5. Based on your results, can you classify $\sqrt{8}$ as a rational number? Explain.
   No; it is not a repeating decimal.

May 14-9:24 AM

Notes:

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Key Concept **Real Numbers**

Work Zone

Words	Rational Number A rational number is a number that can be expressed as the ratio $\frac{a}{b}$, where a and b are integers and $b \neq 0$.	Irrational Number An **irrational number** is a number that *cannot* be expressed as the ratio $\frac{a}{b}$, where a and b are integers and $b \neq 0$.
Examples	$-2, 5, 3.\overline{76}, -12\frac{7}{8}$	$\sqrt{2} \approx 1.414213562...$

STOP and Reflect

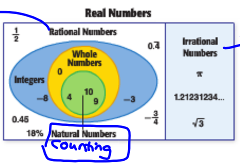
Explain below how you know that $\sqrt{2}$ is an irrational number.

.444....

Sample answer: When you use a calculator, the decimal does not terminate nor repeat so $\sqrt{2}$ is not a rational number.

Numbers that are not rational are called irrational numbers. The square root of any number that is not a perfect square number is irrational. The set of rational numbers and the set of irrational numbers together make up the set of **real numbers**. Study the Venn diagram below.

Real Numbers



Can be written as a fraction

crazy Can't be written as a fraction.

Integer :
⊕ ⊖ whole #
Whole # : 0, 1, 2 . . . .
Natural Counting # : 1, 2. . . . .

May 14-9:25 AM

Notes:

Examples

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

1. **0.2525...** The decimal ends in a repeating pattern. It is a rational number because it is equivalent to $\frac{25}{99}$.

2. $\sqrt{36}$ Since $\sqrt{36} = 6$, it is a natural number, a whole number, an integer, and a rational number.

3. $-\sqrt{7}$ $-\sqrt{7} \approx -2.645751311...$ The decimal does not terminate nor repeat, so it is an irrational number.

Got It? Do these problems to find out.

a. $\sqrt{10}$ b. $-2\frac{2}{5}$ c. $\sqrt{100}$

a. irrational

b. rational

c. natural, whole, integer, rational

May 14-9:25 AM

Notes:

Compare and Order Real Numbers

You can compare and order real numbers by writing them in the same notation. Write the numbers in decimal notation before comparing or ordering them.

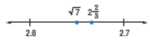
Examples

Fill in each ◯ with <, >, or = to make a true statement.

4. $\sqrt{7}$ ◯ $2\frac{2}{3}$

$\sqrt{7} \approx 2.645751311...$

$2\frac{2}{3} = 2.666666666...$

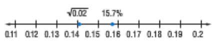


Since 2.645751311... is less than 2.66666666..., $\sqrt{7} < 2\frac{2}{3}$.

5. **15.7%** ◯ $\sqrt{0.02}$

15.7% = 0.157

$\sqrt{0.02} \approx 0.141$



Since 0.157 is greater than 0.141, 15.7% > $\sqrt{0.02}$.

6. **Order the set $\{\sqrt{30}, 6, 5\frac{4}{5}, 5.3\overline{6}\}$ from least to greatest. Verify your answer by graphing on a number line.**

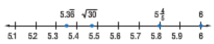
Write each number as a decimal. Then order the decimals.

$\sqrt{30} \approx 5.48$

$6 = 6.00$

$5\frac{4}{5} = 5.80$

$5.3\overline{6} \approx 5.37$



From least to greatest, the order is $5.3\overline{6}$, $\sqrt{30}$, $5\frac{4}{5}$, and 6.

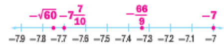
May 14-9:25 AM

Notes:

Got It? Do these problems to find out.

d. $\sqrt{11}$ < $3\frac{1}{3}$ e. $\sqrt{17}$ > 4.03 f. $\sqrt{6.25}$ = 250%

g. Order the set $\{-7, -\sqrt{60}, -7\frac{7}{10}, -\frac{66}{9}\}$ from least to greatest. Verify your answer by graphing on the number line below.



g. $-\sqrt{60}, -7\frac{7}{10}, -\frac{66}{9}, -7$

May 14-9:25 AM

Notes:

Example

7. **On a clear day, the number of miles a person can see to the horizon is about 1.23 times the square root of his or her distance from the ground in feet. Suppose Frida is at the Empire Building observation deck at 1,250 feet and Kia is at the Freedom Tower observation deck at 1,362 feet. How much farther can Kia see than Frida?**

Use a calculator to approximate the distance each person can see.

Frida: $1.23 \cdot \sqrt{1{,}250} \approx 43.49$ Kia: $1.23 \cdot \sqrt{1{,}362} \approx 45.39$

Kia can see 45.39 − 43.49 or 1.90 miles farther than Frida.

May 14-9:25 AM

Guided Practice

Pg 92

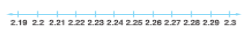
Name all sets of numbers to which each real number belongs. (Examples 1–3)

1. 0.050505... ______ 2. $-\sqrt{64}$ ______ 3. $\sqrt{17}$ ______

Fill in each ◯ with <, >, or = to make a true statement. (Examples 4 and 5)

4. $\sqrt{15}$ ◯ 3.5 5. $\sqrt{2.25}$ ◯ 150% 6. $\sqrt{6.2}$ ◯ $2.\overline{4}$

7. Order the set $\{\sqrt{5}, 220\%, 2.25, 2.\overline{2}\}$ from least to greatest. Verify your answer by graphing on a number line. (Example 6)



8. The formula $A = \sqrt{s(s-a)(s-b)(s-c)}$ can be used to find the area A of a triangle. The variables a, b, and c are the side measures and s is one half the perimeter. Use the formula to find the area of a triangle with side lengths of 7 centimeters, 9 centimeters, and 10 centimeters. (Example 7) ______

9. **Building on the Essential Question** How are real numbers different from irrational numbers?

Rate Yourself!

How well do you understand real numbers? Circle the image that applies.

Clear Somewhat Clear Not So Clear

For more help, go online to access a Personal Tutor.

May 14-9:26 AM

Guided Practice

Check

Name all sets of numbers to which each real number belongs. (Examples 1–3)

1. 0.050505... rational
2. $-\sqrt{64}$ integer, rational
3. $\sqrt{17}$ irrational

Fill in each ◯ with <, >, or = to make a true statement. (Examples 4 and 5)

4. $\sqrt{15}$ > 3.5
5. $\sqrt{2.25}$ = 150%
6. $\sqrt{6.2}$ > $2.\overline{4}$

7. Order the set $\{\sqrt{5}, 220\%, 2.25, 2.\overline{2}\}$ from least to greatest. Verify your answer by graphing on a number line. (Example 6)

220% 2.2 $\sqrt{5}$ 2.25

2.19 2.2 2.21 2.22 2.23 2.24 2.25 2.26 2.27 2.28 2.29 2.3

220%, $2.\overline{2}$, $\sqrt{5}$, 2.25

8. The formula $A = \sqrt{s(s-a)(s-b)(s-c)}$ can be used to find the area A of a triangle. The variables a, b, and c are the side measures and s is one half the perimeter. Use the formula to find the area of a triangle with side lengths of 7 centimeters, 9 centimeters, and 10 centimeters. (Example 7) about 30.6 cm^2

9. Building on the Essential Question How are real numbers different from irrational numbers?

Sample answer: Real numbers contain the sets of rational and irrational numbers. So all irrational numbers are real numbers but not all real numbers are irrational numbers.

Rate Yourself!

How well do you understand real numbers? Circle the image that applies.

Clear Somewhat Clear Not So Clear

For more help, go online to access a Personal Tutor.

92 Chapter 1 Real Numbers

May 14-9:26 AM

Textbook pages from this section
(optional...possibly lab review)

Name ______ My Homework

Independent Practice

Go online for Step-by-Step Solutions

Name all sets of numbers to which each real number belongs. (Examples 1–3)

1. $\frac{2}{3}$ Rational
2. $-\sqrt{20}$ Irrat. $-4.4721359...$
3. 7.2
4. $\frac{12}{4} = 3$ Rational Integer Whole Natural

Fill in each ◯ with <, >, or = to make a true statement. (Examples 4 and 5)

5. $\sqrt{10}$ ◯ 3.2
6. $5\frac{1}{6}$ ◯ $5.\overline{16}$
7. $2.\overline{21}$ ◯ $\sqrt{5.2}$

Order each set of numbers from least to greatest. Verify your answer by graphing on a number line. (Example 6)

8. -415%, $-\sqrt{17}$, $-4.\overline{1}$, -4.08

9. $\sqrt{5}$, $\sqrt{6}$, 2.5, 2.55, $\frac{7}{3}$ $\to 2.23...$ $2.4...$ $\to 2.3$

−4.18 −4.16 −4.14 −4.12 −4.1 −4.08

2.1 2.2 2.3 2.4 2.5 2.6 2.7

10. The equation $s = \sqrt{30fd}$ can be used to find a car's speed s in miles per hour given the length d in feet of a skid mark and the friction factor f of the road. Police measured a skid mark of 90 feet on a dry concrete road. If the speed limit is 35 mph, was the car speeding? Explain. (Example 7)

Friction Factor		
Road	Concrete	Tar
Wet	0.4	0.5
Dry	0.8	1.0

11. The surface area in square meters of the human body can be found using the expression $\sqrt{\frac{hm}{3{,}600}}$ where h is the height in centimeters and m is the mass in kilograms. Find the surface area of a 15-year-old boy with a height of 183 centimeters and a mass of 74 kilograms. (Example 7)

May 14-9:26 AM

Textbook pages from this section
(optional...possibly lab review)

12. Be Precise Write a brief description and give an example of each type of number in the graphic organizer shown.

natural	whole	integer	rational	irrational

Use estimation to fill in each ◯ with <, >, or = to make a true statement.

13. 3π ◯ $\sqrt{78}$
14. π^2 ◯ $3 \cdot \sqrt{15}$
15. $\sqrt{980}$ ◯ $4\pi^2$

H.O.T. Problems Higher Order Thinking

16. Use a Counterexample Give a counterexample for the statement *All square roots are irrational numbers.* Explain your reasoning.

Persevere with Problems Tell whether the following statements are *always*, *sometimes*, or *never* true. If a statement is not always true, explain.

17. Integers are rational numbers.

18. Rational numbers are integers.

19. The product of a non-zero rational number and an irrational number is irrational.

20. Model with Mathematics Identify two numbers, one rational number and one irrational number, that are between 1.4 and 1.6. Include the decimal approximation of the irrational number to the nearest hundredth.

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Textbook pages from this section
(optional...possibly lab review)

Extra Practice

21. Name all sets of numbers to which $\sqrt{10}$ belongs. irrational

$\sqrt{10} = 3.16227766...$ Since the decimal does not terminate nor repeat, it is an irrational number.

22. Fill in ◯ with <, >, or = to make $5.\overline{15}$ > $\sqrt{26}$ a true statement.

Write each number as a decimal.
$5.\overline{15} = 5.151515...$
$\sqrt{26} = 5.099019...$
Since 5.151515... is greater than 5.099019..., $5.\overline{15} > \sqrt{26}$.

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

23. 14
24. $-\sqrt{16}$
25. $-\sqrt{90}$

Fill in each ◯ with <, >, or = to make a true statement.

26. $\sqrt{12}$ ◯ 3.5
27. $6\frac{1}{3}$ ◯ $\sqrt{240}$
28. 240% ◯ $\sqrt{5.76}$

30. Persevere with Problems In the sequence 4, 12, ■, 108, 324, the missing number can be found by simplifying $\sqrt{ab}$ where a and b are the numbers on either side of the missing number. Find the missing number.

Fill in each ◯ with <, >, or = to make a true statement.

31. $3 + \sqrt{7}$ ◯ 6
32. $4 - \sqrt{10}$ ◯ $\sqrt{2}$
33. 13 ◯ $8 + \sqrt{20}$

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Power Up! Common Core Test Practice

Textbook pages from this section
(optional...possibly lab review)

34. Mr. Rodgers gave his students a test that was worth 100 points. Erika earned an 84%, Joe earned $\frac{5}{6}$ of the total points, Malcolm earned $\sqrt{7225}$ points, and Stephanie earned $\frac{83}{100}$ points. Plot points on the number line to represent each students' score.

Number of Points

Which student earned the most points?

35. The diagonal of a rectangular room is $\sqrt{289}$ feet long. To which sets of numbers does $\sqrt{289}$ belong? Select all that apply.

- ☐ real
- ☐ rational
- ☐ whole
- ☐ integer
- ☐ irrational
- ☐ natural

Common Core Spiral Review

36. Order the set $\{7, \sqrt{53}, \sqrt{32}, 6\}$ from least to greatest. 8.EE.2

Solve each equation. 8.EE.2

37. $t^2 = 25$
38. $y^2 = \frac{1}{49}$
39. $0.64 = c^2$

Evaluate each expression. Express the result in scientific notation. 8.EE.4

40. $(7.2 \times 10^4)(1.1 \times 10^{-6}) =$
41. $(3.6 \times 10^3) + (5.7 \times 10^5) =$

42. The table shows the approximate population of several countries. Order the countries from the greatest population to the least population. 8.EE.4

Country	Population
China	1.3×10^9
India	1.2×10^9
Indonesia	2.3×10^8
United States	3.1×10^8

96 Need more practice?

May 14-9:27 AM

Homework: Complete Evens on the Lesson 10 Homework Worksheet

NAME ______ DATE ______ PERIOD

Lesson 10 Homework Practice

Compare Real Numbers

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

1. −9
2. $\sqrt{144}$
3. $\sqrt{35}$
4. $\frac{8}{11}$
5. 9.55
6. $5.\overline{3}$
7. $\frac{20}{5}$
8. $-\sqrt{44}$

Replace each ● with <, >, or = to make a true statement.

9. $\sqrt{8}$ ● 2.7
10. $\sqrt{15}$ ● 3.9
11. $5\frac{2}{5}$ ● $\sqrt{30}$
12. $2\frac{3}{10}$ ● $\sqrt{5.29}$
13. $\sqrt{9.8}$ ● $3.\overline{1}$
14. $8.\overline{2}$ ● $8\frac{2}{9}$

Order each set of numbers from least to greatest. Verify your answer by graphing on a number line.

15. $\sqrt{10}$, $\sqrt{8}$, 2.75, $2.\overline{8}$
16. 5.01, $5.0\overline{1}$, $5.\overline{01}$, $\sqrt{26}$
17. $-\sqrt{12}$, $\sqrt{13}$, −3.5, 3.5

18. ALGEBRA The *geometric mean* of two numbers a and b is $\sqrt{ab}$. Find the geometric mean of 32 and 50.

19. ART The area of a square painting is 600 square inches. To the nearest hundredth inch, what is the perimeter of the painting?

Sep 20-1:16 PM

How did what you learned today help you answer the

Essential Question

WHY is it helpful to write numbers in different ways?

Sample answer:

- Not all numbers can be written the same way. For example, an irrational number cannot be written as an integer.

Exit ticket:

Simplify $x^2 \cdot x^3$

Sep 20-10:46 AM

Sep 20-1:18 PM

May 14-9:27 AM