

Order Real Numbers

R 8.2(D) Order a set of real numbers arising from mathematical and real-world contexts.

Understand the TEKS

You have learned that the set of **real numbers** consists of **rational numbers** and **irrational numbers**. All real numbers can be graphed on a number line. In fact, between any two real numbers, there is always another real number.

To order a set of real numbers, graph the numbers on a number line. Then write the numbers in order from least to greatest or greatest to least.

You will need to write some rational and irrational numbers in decimal form to graph them on a number line. Use perfect squares to find rational approximations of irrational numbers that are square roots. For example, $\sqrt{23}$ lies between $\sqrt{16}$ and $\sqrt{25}$, so it lies between the numbers 4 and 5 on the number line.



Did You Know?

NUMBER SENSE

Every point on a number line corresponds to a real number. Between every two real numbers, there is always another real number.

Order these numbers from greatest to least: $\frac{1}{2}$, $\sqrt{4}$, $-\frac{7}{3}$, 1.2, π , -2.9.

Step 1 Identify rational and irrational numbers. Write the numbers in decimal form.

$\frac{1}{2}$ This is a rational number. $\frac{1}{2} =$ _____

$\sqrt{4}$ This is a perfect square. $\sqrt{4} =$ _____

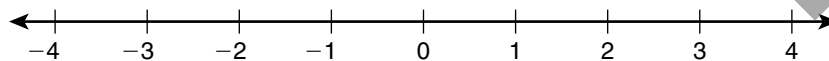
$-\frac{7}{3}$ This is a _____ number. $-\frac{7}{3} =$ _____

1.2 This is a _____ number already in decimal form.

π Pi is an irrational number. $\pi \approx$ _____

-2.9 This is a rational number already in _____ form.

Step 2 Graph each number on a number line.



Step 3 Order the numbers.

Moving left to right on the number line, the numbers are ordered _____
to _____.

In order from greatest to least, the numbers are: _____.

★ Practice

DIRECTIONS Read and answer each question carefully.

1 Which list orders the numbers below from least to greatest?

$$\frac{5}{9}, \frac{3}{8}, 0.65, \sqrt{16}, \frac{33}{8}$$

(A) $\frac{33}{8}, \sqrt{16}, \frac{5}{9}, 0.65, \frac{3}{8}$

(B) $\frac{3}{8}, \frac{5}{9}, 0.65, \sqrt{16}, \frac{33}{8}$

(C) $0.65, \frac{3}{8}, \frac{5}{9}, \frac{33}{8}, \sqrt{16}$

(D) $\sqrt{16}, \frac{33}{8}, \frac{5}{9}, \frac{3}{8}, 0.65$

2 The table of values lists the running times of four people in a field day event.

Runner	Time
Ana	31.10
Chris	31.81
Julio	31.11
Maria	31.51

What is the order of the runners from fastest to slowest?

Write the correct answer in each box.

Ana	Chris	Julio	Maria
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Fastest \longrightarrow **Slowest**

3 Carmen wrote the numbers $\frac{\sqrt{9}}{4}$, $-\frac{9}{10}$, $\sqrt{1}$, $\frac{9}{\sqrt{15}}$, and $-\sqrt{64}$ in order from least to greatest. Which statement is **NOT** true about the numbers?

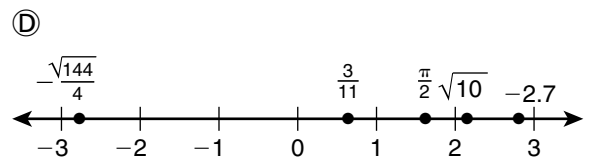
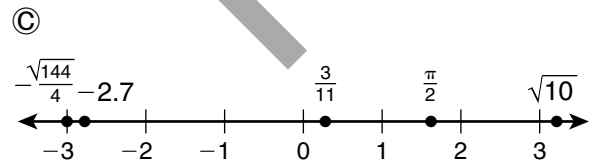
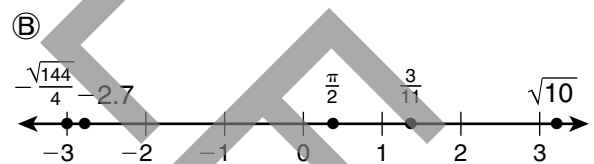
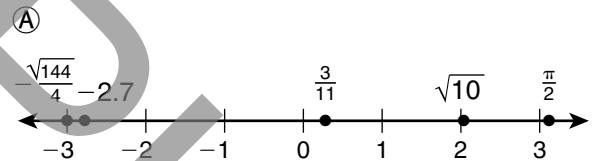
(A) $\frac{9}{\sqrt{15}}$ is the greatest number.

(B) $\sqrt{1}$ is greater than $-\frac{9}{10}$.

(C) $-\sqrt{64}$ is the least number.

(D) $\frac{9}{\sqrt{15}}$ is less than $\frac{\sqrt{9}}{4}$.

4 Which number line correctly represents $-\frac{\sqrt{144}}{4}$, $\frac{3}{11}$, $\sqrt{10}$, $\frac{\pi}{2}$, and -2.7 graphed?





- 5 Ms. Lopez is reducing the prices of some items in her clothing store. The table shows the different price reductions.

Item	Price Reduction
hats	35%
scarves	$\frac{3}{4}$
jackets	$\frac{4}{5}$
mittens	66%
flannel shirts	$\frac{1}{3}$

Which list shows the items in order from most reduced to least?

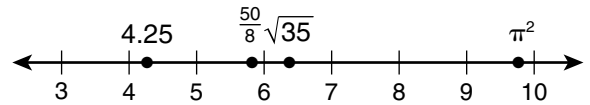
- (A) Hats, flannel shirts, scarves, jackets, mittens
- (B) Flannel shirts, scarves, jackets, hats, mittens
- (C) Mittens, hats, scarves, flannel shirts, jackets
- (D) Jackets, scarves, mittens, hats, flannel shirts

- 6 Oscar ordered the following numbers from greatest to least: 6.3 , $\sqrt{27}$, $4\sqrt{2}$, $\frac{\sqrt{36}}{\sqrt{1}}$, $\frac{42}{8}$.

Which list shows the correct order?

- (A) 6.3 , $\frac{\sqrt{36}}{\sqrt{1}}$, $4\sqrt{2}$, $\frac{42}{8}$, $\sqrt{27}$
- (B) 6.3 , $\frac{42}{8}$, $\sqrt{27}$, $\frac{\sqrt{36}}{\sqrt{1}}$, $4\sqrt{2}$
- (C) $\sqrt{27}$, $\frac{42}{8}$, $4\sqrt{2}$, $\frac{\sqrt{36}}{\sqrt{1}}$, 6.3
- (D) $4\sqrt{2}$, $\sqrt{27}$, $\frac{42}{8}$, $\frac{\sqrt{36}}{\sqrt{1}}$, 6.3

- 7 Marcy placed the numbers $\frac{50}{8}$, π^2 , 4.25 , and $\sqrt{35}$ on the number line.



Marcy made a mistake when ordering the numbers. Why are they not in the correct order?

Circle the correct answer from each drop-down menu to complete the statement.

The numbers are not in the correct order

because π^2 is less than greater than $\sqrt{35}$ and 4.25 .

$\sqrt{35}$ is greater than $\frac{50}{8}$.

- 8 Rosa graphs the numbers $-\sqrt{25}$, $-\frac{\sqrt{16}}{3}$, $\frac{\sqrt{12}}{2}$, $\frac{\sqrt{144}}{4.25}$, $-\sqrt{5}$ in order from least to greatest on a number line.

What integer will be closest to the third number in the ordered set?

Write your answer in the box.