

Warm Up. Copy Question, Solve and Put answers

1. Which statement about rational numbers is true?

- A Rational numbers can't be written as a ratio. F
- B Rational numbers are numbers that can be written as ratios of two integers where zero is the denominator. F
- C Rational numbers are numbers that can be written as the ratio of two integers where zero is not the denominator. A ratio can be expressed as a fraction.
- D Rational numbers can't be expressed as a fraction. F

2. Sammy worked late, so he decided to go out to eat at his favorite restaurant. His meal cost \$22.56. The tax on the bill was 8.25%. Sammy left the waiter a 12% tip that included tax. Which expression below can be used to represent the tip Sammy left?

- A $0.12[\$22.56 + (0.0825 \cdot \$22.56)]$
- B $0.825[\$22.56 + (0.12 \cdot \$22.56)]$
- C $0.12[\$22.56 + (0.0825 \cdot \$0.825)]$
- D $0.12[\$22.56 + (\$22.56 \cdot \$22.56)]$

Go over HW

$$1) 1 - 5 = -4$$

$$\begin{array}{r} \rightarrow | -5 | - | 1 | \\ 5 - 1 \\ 4 \end{array}$$

$$2) 4 - (-2) = 6$$

$$\begin{array}{r} \text{Keep} \\ \text{common} \\ \text{sign} \rightarrow 4 + 2 \\ | 4 | + | 2 | \\ 4 + 2 \end{array}$$

$$3) -3 - 2 = -5$$

$$\begin{array}{r} \text{Keep} \\ \text{common} \\ \text{sign} \rightarrow | -3 | + | -2 | \\ 3 + 2 \\ 5 \end{array}$$

$$4) -5 + 8 = 3$$

$$\begin{array}{r} \text{Keep} \\ \text{this} \\ \text{sign} \rightarrow | 8 | - | -5 | \\ 8 - 5 \\ 3 \end{array}$$

$$5) -3 + (-3) = -6$$

$$\begin{array}{r} \text{Keep} \\ \text{common} \\ \text{sign} \rightarrow | -3 | + | -3 | \\ -3 - 3 \\ 3 + 3 \\ 6 \end{array}$$

$$6) 2 + (-9) = -7$$

$$\begin{array}{r} \text{Keep} \\ \text{this} \\ \text{sign} \rightarrow | -9 | - | 2 | \\ 2 - 9 \\ 9 - 2 \\ 7 \end{array}$$

$$7) 7 + (-10) = -3$$

$$\begin{array}{r} \text{Keep} \\ \text{this} \\ \text{sign} \rightarrow | -10 | - | 7 | \\ 7 - 10 \\ 10 - 7 \\ 3 \end{array}$$

$$8) -7 + 13 = 6$$

$$\begin{array}{r} \text{Keep} \\ \text{this} \\ \text{sign} \rightarrow | 13 | - | -7 | \\ 13 - 7 \\ 6 \end{array}$$

$$9) -3 + (-1) + (-2) = -6$$

$$\begin{array}{r} -3 - 1 - 2 \\ \text{Keep} \\ \text{common} \\ \text{sign} \rightarrow | -3 | + | -1 | + | -2 | \\ 3 + 1 + 2 \\ 6 \end{array}$$

10) A submarine is cruising at 40 m below...

10) A submarine is cruising at 40 m below sea level. The submarine ascends 18 m. What is the submarine's new location?

sign
 common sign
 $-40 + 18$
 $|-40| = 40$
 $40 - 18 = 22$
 Keep the sign

The submarine's new location is 22 m below sea level.

Challenge: During a possession in a football game, the Vikings gained 22 yards, lost 15 yards, gained 3 yards, gained 20 yards and lost 5 yards. At the end of the possession, how many yards had they lost or gained?

$$22 - 15 + 3 + 20 - 5$$

$$7 + 3 + 20 - 5$$

$$10 + 20 - 5$$

$$30 - 5$$

$$25$$



- A Q
- B R
- C S
- D T

$$-\sqrt{36} = -6 \quad -\sqrt{25} = -5$$

$-\sqrt{30}$ is between -5 and -6

2) The value of $\sqrt{27}$ is between which two consecutive integers?

- A 27 and 28
- B 13 and 14
- C 5 and 6
- D 2 and 3

$$\sqrt{25} = 5 \quad \sqrt{27} \quad \sqrt{36} = 6$$

3) What is the approximate difference between $\sqrt{120}$ and $\sqrt{80}$?

- A 2
- B 4
- C 20
- D 40

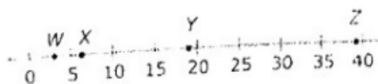
① $\sqrt{120}$ is approximately $\sqrt{121}$, which equals 11.
 $\sqrt{80}$ is approximately $\sqrt{81}$, which equals 9.
 ② Find the difference.
 $11 - 9 = 2$

4) Which number below is greater than 3 but less than 6?

- A $\sqrt{50}$
- B $\sqrt{8}$
- C $\sqrt{15}$
- D $\sqrt{5}$

$\sqrt{49} = 7$, $\sqrt{50}$, $\sqrt{64} = 8$ → not between 3 and 6.
 $\sqrt{4} = 2$, $\sqrt{8}$, $\sqrt{9} = 3$ → too low, because it is less than 3.
 $\sqrt{9} = 3$, $\sqrt{15}$, $\sqrt{16} = 4$ → yes, it is between 3 and 6.
 $\sqrt{4} = 2$, $\sqrt{5}$, $\sqrt{9} = 3$ → too low, because it is less than 3.

5) Which point is located at approximately $\sqrt{39}$ on the number line below?



- A W
- B X
- C Y
- D Z

$$\sqrt{36} = 6 \quad \sqrt{39} \quad \sqrt{49} = 7$$

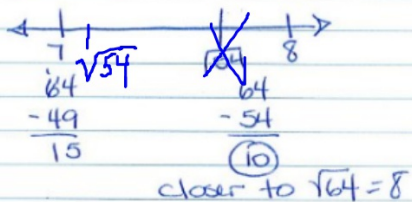
$\sqrt{39}$ is between 6 and 7

$$\sqrt{49} \quad \sqrt{54} \quad \sqrt{64}$$

$$= 7 \quad \quad \quad = 8$$

falls between
7 and 8

7. Draw a number line. Label the two consecutive integers that $\sqrt{54}$ falls between.



9. $\sqrt{24} + \sqrt{50}$

$\sqrt{24}$ is approximately
 $\sqrt{25} = 5$

$\sqrt{50}$ is approximately
 $\sqrt{49} = 7$

$\therefore 5 + 7 \approx 12$

10. $2.\overline{13}$ to a fraction

$\times 10 \quad 21.\overline{3}$

A to fraction put repeats
over 9 $21\frac{3}{9}$

$21\frac{1}{3}$

A to improper

$\frac{64}{3}$

$\div 10 \quad \frac{64}{3} \div 10$

$\frac{64}{3} \times \frac{1}{10} = \frac{64}{30} = 2$

$\frac{32}{15}$

8. $\sqrt{93}$ How wide

$\sqrt{81} \quad \sqrt{93} \quad \sqrt{100}$

$= 9 \quad \quad \quad = 10$

$93 \quad \quad \quad 100$

$- 81 \quad \quad \quad - 93$

$12 \quad \quad \quad \textcircled{7}$

closer to $\sqrt{100} = 10$

\therefore about 10 inches

11. $3\overline{03} \times 1\frac{1}{3}$

$\times 10$
 $30.\overline{3} \times 1\frac{1}{3}$

$30\frac{3}{9} \times 1\frac{1}{3}$

$30\frac{1}{3} \times 1\frac{1}{3}$

$\frac{91}{3} \times \frac{4}{3} \times 1\frac{1}{3}$

$15\frac{91}{30} \times \frac{4}{3} \quad \left| \frac{182}{45} \right|$



Rules for Multiplying Integers:
Use the eraser to reveal the results.



Even number of negatives = Positive
Odd number of Negatives = Negative

Positive x positive = positive

$$+ \quad x \quad + \quad = \quad +$$

Negative x negative = positive

$$- \quad x \quad - \quad = \quad +$$



Try some.



Find the products - move the positive and negative to remind you of the rule.

$$-5 \times (-4) = 20$$

Positive +

$$-5 \times 4 = -20$$

Negative -

$$6 \times (-7) = -42$$





Rules for Dividing Integers:
Use the eraser to reveal the results.



Even number of negatives = Positive
Odd number of Negatives = Negative

Positive \div positive = positive

$$+ \div + = +$$

Negative \div negative = **positive**

$$- \div - = +$$



Try some.

Find the quotients - move the positive and negative to remind you of the rule!

$$-48 \div 6 = -8$$

Positive +

$$24 \div -6 = -4$$

Negative -

$$-63 \div -9 = 7$$





Introduction: Practice with Word Problems



Figuring an offensive team's total yardage gained is not just a case of adding up the numbers.

Players make positive plays, such as yards gained rushing and yards gained passing.

They also make negative plays, such as yards lost rushing or yard lost on a quarterback sack.



There are also penalties; they work both ways.

Examine the following game situations and figure the total yards gained by the team.



In one game the San Diego Chargers gained 187 yards rushing and 458 passing. But they had 211 yards of penalties against the offense.

How many total yards did they gain that night?

$$187 + 458 - 211$$
$$645 - 211$$
$$\boxed{434 \text{ yds}}$$



The price of a stock market decreased \$2 per day for four consecutive days. What was the total change in value of the stock market over the four-day period?

$$4(-2) = -8$$

There is a decrease of
\$8.