

Accelerated Math Review for TEST
Ch.3 Rational Numbers

Name _____
Block _____ Date _____

Key

This is a no calculator test.

You should be able to do the following:

- *Convert fractions to decimals and decimals to fractions
- *Order and compare rational numbers
- *Follow algebraic steps to convert repeating decimals to fractions
- *Identify and use the definition to prove a number is rational
- *Identify number sets to which a number belongs (natural, whole, integer, rational)
- *Add, subtract, multiply and divide fractions, mixed numbers and decimals with signs
- *Solve application problems
- *Use the order of operations agreement with rational numbers
- *Multiply and Divide fractions that include variables
- *Evaluate algebraic expressions using rational numbers for the variables
- *Graph and identify rational numbers on the number line.

You should know and be able to use the following vocabulary words:

rational number
integer
natural number
product
difference

bar notation
reciprocal
whole number
quotient
simplest terms

terminating decimal
repeating decimal
multiplicative inverse
sum
mean

proper fraction
median
improper fraction

AC Chapter 3 Review for Test Key

<p>1) Find the multiplicative inverse of $5\frac{1}{2}$.</p> <p>$\frac{11}{2}$ $\frac{2}{11}$</p>	<p>2) Find the quotient of $\frac{1}{3}$ and $\frac{1}{2}$.</p> <p>$\frac{1}{3} \div \frac{1}{2}$ $\frac{1}{3} \cdot \frac{2}{1} = \frac{2}{3}$</p>	<p>3) $(\frac{1}{2})(-\frac{1}{4})(\frac{1}{3})$</p> <p>$-\frac{1}{24}$</p>
<p>4) $(\frac{ab}{3})(\frac{6}{a})^2 =$</p> <p>$2b$</p>	<p>5) Find the product of $\frac{5}{12}$ and $\frac{1}{10}$.</p> <p>$\frac{5}{12} \cdot \frac{1}{10} = \frac{1}{24}$</p>	<p>6) Find the reciprocal of -8.</p> <p>$-\frac{8}{1}$ $-\frac{1}{8}$</p>
<p>7) Prove that 1.3 is a rational number using the definition of a rational number.</p> <p>$1.3 = 1\frac{3}{10} = \frac{13}{10}$</p> <p>so it can be written as $\frac{a}{b}$ (with $a=13$ $b=10$)</p>	<p>8) Evaluate $-4a$ if $a = \frac{1}{2}$.</p> <p>$-4 \cdot \frac{1}{2}$ $-\frac{4}{1} \cdot \frac{1}{2}$ -2</p>	<p>9) Circle the number sets that -9 belongs to.</p> <p>Natural Rational</p> <p>Integer Whole</p>

where a and b are integers and $b \neq 0$

10) $-0.0012 \div 0.03$

$$\begin{array}{r} 0.03 \overline{) 0.0012} \\ \underline{0.04} \\ 3 \overline{) 0.12} \end{array}$$

-0.04

11) $-\frac{5}{9} + \frac{5}{12}$

$$-\frac{20}{36} + \frac{15}{36}$$

$-\frac{5}{36}$

12) $(\frac{75}{36})(\frac{-51}{125})(\frac{45}{68})$

$$\begin{array}{ccc} \frac{3}{75} & \frac{-3}{51} & \frac{5}{45} \\ \hline \frac{36}{36} & \frac{125}{125} & \frac{68}{68} \\ \hline 4 & 5 & 4 \end{array}$$

$-\frac{9}{16}$

13) Evaluate if $a = -\frac{2}{3}$, $b = \frac{1}{2}$ and $c = -\frac{1}{5}$ $ab^4 + c$

$$-\frac{2}{3} \cdot (\frac{1}{2})^4 + -\frac{1}{5}$$

$$-\frac{2}{3} \cdot \frac{1}{16} + -\frac{1}{5} = -\frac{2}{48} + -\frac{1}{5} = -\frac{5}{120} + -\frac{24}{120} = -\frac{29}{120}$$

14) A science workbook is $\frac{3}{4}$ in. thick. How many workbooks will fit on a 2-ft shelf?

24 in.

$$24 \div \frac{3}{4}$$

$$\frac{8}{24} \cdot \frac{4}{3}$$

32 workbooks

15) $(-679 - 2.6) + (4.02 - 56)$

$$(-679 - 2.6) + (4.02 - 56) = -681.6 + -51.98$$

-733.58

$$\begin{array}{r} 679.20 \\ + 2.6 \\ \hline 681.6 \\ 681.6 \\ + 51.98 \\ \hline 733.58 \\ 56.00 \\ - 4.02 \\ \hline 51.98 \end{array}$$

16) True or False? Explain your reasoning. The sum of two rational numbers is always greater than each of the two addends.

$-\frac{1}{2} + -\frac{3}{4}$ counterexample

$-\frac{2}{4} + -\frac{3}{4} = -\frac{5}{4} = -1\frac{1}{4}$ less than each addend.

17) Circle all sets of numbers to which $5.\bar{3}$ belongs.

rational irrational natural whole integer

18) $\frac{-7}{8} \div 2\frac{7}{12}$

$$-\frac{7}{8} \div \frac{31}{12}$$

$$-\frac{7}{8} \cdot \frac{12}{31}$$

$-\frac{21}{62}$

19) $-0.0567 \div 0.9$

$$\begin{array}{r} 0.9 \overline{) 0.0567} \\ \underline{0.063} \\ 9 \overline{) 0.567} \\ \underline{54} \\ 27 \\ \underline{-27} \end{array}$$

-0.063

20) $(-15.4)(0.0029)$

$$\begin{array}{r} 15.4 \\ \cdot 0.0029 \\ \hline 1386 \\ 3080 \\ \hline -4466 \end{array}$$

-0.04466

21) Write the fraction that is equivalent to each decimal. Be sure it is in simplest form.

A) 0.062

$\frac{62}{1000} = \frac{31}{500}$

B) 0.8

$\frac{4}{5}$

C) 0.18

$\frac{18}{100} = \frac{9}{50}$

D) $0.\overline{3}$

$\frac{1}{3}$

D) 0.375

$\frac{3}{8}$

E) $0.\overline{2}$

$\frac{2}{9}$

22) $\left(\frac{2}{5}\right)^2 \div \left(\frac{3}{10}\right) - \left(\frac{3}{4}\right)\left(\frac{8}{9}\right)$

$\frac{4}{25} \div \frac{3}{10} - \frac{2}{3}$

$\frac{8}{15} - \frac{2}{3}$

$\frac{8}{15} + \frac{-10}{15}$

$\frac{-2}{15}$

$\frac{3^1}{4} \cdot \frac{8^2}{9^3} = \frac{2}{3}$

$\frac{4}{25} \div \frac{3}{10}$

$\frac{4}{25} \cdot \frac{10^2}{3}$

$\frac{8}{15}$

23) Find the mean and median of this set of numbers.

-0.52 3.8 -1.8 0.25 0.03

SUM = $-2.32 + 4.08 = 1.76$

mean = $\frac{1.76}{5} = 0.352$

-1.8 -0.52 0.03 0.25 3.8

↑
median

$\begin{array}{r} 34.08 \\ -2.32 \\ \hline 1.76 \end{array}$

24) $\frac{7}{8}$ of the 240 7th graders at LMS made honor roll for the first marking period. Of these students, $\frac{1}{5}$ made highest honors. How many students made highest honors?

$$\frac{7}{8} \cdot \frac{240}{1} = 210 \text{ Honor roll}$$

$$\frac{1}{5} \cdot \frac{210}{1} = 42 \text{ students}$$

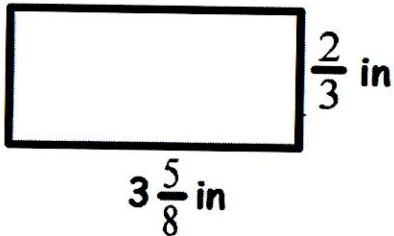
25) Write $0.\overline{36}$ as a fraction in simplest form.

$$\begin{array}{r} 10n = 3.666\dots \\ - n = 0.366\dots \\ \hline 9n = 3.3 \end{array}$$

$$\frac{9n}{9} = \frac{3.3}{9}$$

$$n = \frac{3.3}{9} = \frac{33}{90} = \frac{11}{30}$$

26) Find the area and perimeter of this rectangle.



$$A = lw$$

$$A = 3\frac{5}{8} \cdot \frac{2}{3}$$

$$A = \frac{29}{8} \cdot \frac{2}{3}$$

$$A = \frac{29}{12}$$

$$P = 2(l+w)$$

$$P = 2\left(3\frac{5}{8} + \frac{2}{3}\right)$$

$$P = 2\left(3\frac{31}{24}\right)$$

$$P = 2 \cdot 4\frac{7}{24}$$

$$P = \frac{2}{1} \cdot \frac{103}{24}$$

$$A = 2\frac{5}{12} \text{ in}^2$$

$$P = 8\frac{7}{12} \text{ in.}$$

27) Sometimes, Always, Never Explain your reasoning. Assume nonzero values.

When you multiply a proper fraction by an improper fraction, you get a proper fraction.

$$\frac{2}{3} \cdot \frac{3}{2} = 1 \text{ no}$$

$$\frac{2}{3} \cdot \frac{7}{84} = \frac{7}{12} \text{ yes}$$

$$28) -54\frac{2}{5} - -24\frac{7}{8}$$

$$-54\frac{16}{40} + 24\frac{35}{40}$$

$$54\frac{16}{40} = 53\frac{56}{40}$$

$$\begin{array}{r} -24\frac{35}{40} = -24\frac{35}{40} \\ \hline 29\frac{21}{40} \end{array}$$

$$-29\frac{21}{40}$$

$$29) -9.82 + 24.7$$

subt
Ans pos

$$\begin{array}{r} 24.710 \\ -9.82 \\ \hline 14.88 \end{array}$$

$$14.88$$

$$30) 34\frac{2}{9} - 74\frac{1}{6}$$

$$34\frac{4}{18} + -74\frac{3}{18}$$

subt
neg

$$74\frac{3}{18} = 73\frac{21}{18}$$

$$-34\frac{4}{18} = -34\frac{4}{18}$$

$$\begin{array}{r} 73\frac{21}{18} \\ -34\frac{4}{18} \\ \hline 39\frac{17}{18} \end{array}$$

$$-39\frac{17}{18}$$

31) Write $0.\overline{125}$ as a fraction in lowest terms.

$$100n = 12.525...$$

$$n = 0.125...$$

$$99n = 12.4$$

$$\frac{99n}{99} = \frac{12.4}{99}$$

$$n = \frac{124}{990} = \frac{62}{495}^*$$

32) Sam ran $4\frac{2}{3}$ miles in $\frac{3}{4}$ of an hour. Find how many miles per hour he was running.

miles per hour

$$4\frac{2}{3} \div \frac{3}{4}$$

$$\frac{14}{3} = \frac{4}{3}$$

$$\frac{56}{9}$$

$$6\frac{2}{9} \text{ mi/hr.}$$

Key

33) The table shows the distance Jon runs over a four-day period.

Jon's Running	
Day	Distance(mi)
Sat	4.5
Sun	$10\frac{1}{4}$
Mon	8.8
Tues	$2\frac{1}{5}$

A) How many more miles did he run on Monday than on Tuesday?

$$8.8 - 2\frac{1}{5}$$

$$\begin{array}{r} 8.8 \\ - 2.2 \\ \hline 6.6 \text{ mi} \end{array} \quad \text{or} \quad 6\frac{3}{5} \text{ mi}$$

B) What was his total distance, in miles, that he ran for the four days?

$$\begin{array}{r} 4.5 \\ 10.25 \\ 8.8 \\ 2.2 \\ \hline 25.75 \text{ mi} \end{array}$$

C) How many more miles did Jon run on Sunday than on Saturday?

$$10\frac{1}{4} - 4.5$$

$$\begin{array}{r} 10\frac{1}{4} = 9\frac{5}{4} \\ - 4\frac{1}{2} = 4\frac{2}{4} \\ \hline 5\frac{3}{4} \text{ mi} \end{array} \quad \text{or} \quad \begin{array}{r} 10.25 \\ - 4.50 \\ \hline 5.75 \text{ mi} \end{array}$$

D) Find his average miles per day for the four days (Remember to refer to the total in Part B)

$$\begin{array}{r} 6.4375 \\ 4 \overline{) 25.75} \\ \underline{24} \\ 17 \\ \underline{16} \\ 15 \\ \underline{12} \\ 30 \\ \underline{28} \\ 20 \\ \underline{20} \\ 0 \end{array}$$

6.4375 mi

or $25\frac{3}{4} \div 4$

$$\frac{103}{4} = \frac{1}{4}$$

$$\frac{103}{16} = 6\frac{7}{16} \text{ mi}$$