Grade 9 Math ANSWERS

November MID-TERM EXAM PREPARATION

CHAPTER 3 – RATIONAL NUMBERS

Define the following terms:

Rational Number: any # that can be written as a fraction

Irrational Number: can't be written as a fraction
↳ in decimal form: it goes on forever + doesn't repeat

1. Which numbers are rational numbers? Why or why not?

yes a) $\sqrt{\frac{1}{25}}$ $= \frac{1}{5}$ it is a fraction

yes b) 1.235 it ended 1235/1000

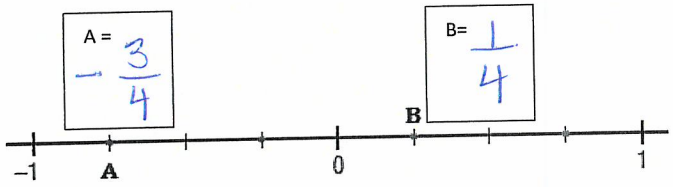
yes c) $.\overline{6}$ it repeats 2/3

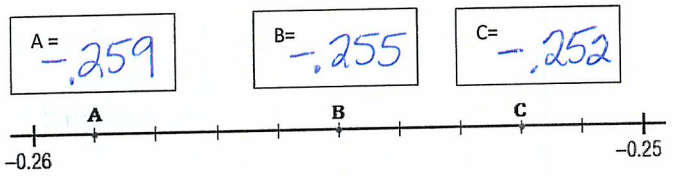
NO d) $\sqrt{8}$ NO 2.828427125 doesn't end or repeat

yes e) $\frac{16}{21}$ it is a fraction

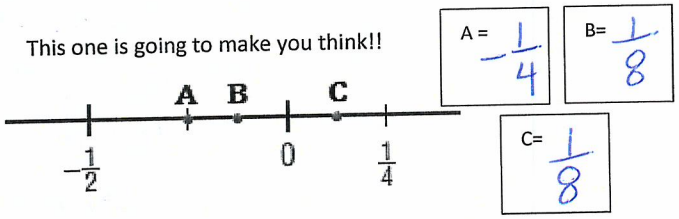
NO f) 4.12946572... doesn't end or repeat

2. Write the rational number represented by each letter on the number line, as a fraction and as a decimal.





This one is going to make you think!!



3. Write 3 rational numbers between each pair of numbers. Sketch a number line to show all the rational numbers. Place them on a number line.

a) -5 and -6

$-5\frac{1}{2}$, −5.25, −5.9

b) 2.4 and 2.5

2.4 2.44, 2.48, 2.49 2.5

−3.25 −2.5 −1.3 −.4

4. Order the numbers from least to greatest.

a) N N N N

b) $\frac{19}{5}, -\frac{13}{4}, \frac{3}{4}, -2\frac{1}{2}, -\frac{13}{10}, -\frac{2}{5}$

3.8 .75

$-3.25, -2.5, -1.3, -.4, .75, 3.8$

$-\frac{13}{4}, -2\frac{1}{2}, -\frac{13}{10}, -\frac{2}{5}, \frac{3}{4}, \frac{19}{5}$

b) $\frac{2}{9}, -0.2, 0.25, -\frac{1}{6}, -0.\overline{1}, \frac{1}{8}$

.2, −.2 −.16 .125

$-.2, -\frac{1}{6}, -0.\overline{1}, \frac{1}{8}, \frac{2}{9}, .25$

5. Find the sum.

a) 17.4 + (−15.96)

$$\begin{array}{r} 17.4 \\ -\ 15.96 \\ \hline 1.44 \end{array}$$

b) −8.38 + (−1.927) both negative

$$\begin{array}{r} 8.38 \\ +\ 1.927 \\ \hline -10.307 \end{array}$$

c) −4.5 − (−13.67)

−4.5 + (13.67)

$$\begin{array}{r} 13.67 \\ -\ 4.5 \\ \hline 9.17 \end{array}$$

d) 13.28 − 19.71

13.28 + (−19.71)

$$\begin{array}{r} 19.71 \\ -\ 13.28 \\ \hline -6.43 \end{array}$$

e) $-\frac{3}{4} + \frac{2}{3}$

$-\frac{3}{4}\left(\frac{3}{3}\right) + \frac{2}{3}\left(\frac{4}{4}\right)$

$-\frac{9}{12} + \frac{8}{12}$

$-\frac{1}{12}$

f) $1\frac{5}{8} + \left(-6\frac{1}{3}\right)$

$\frac{13}{8}\left(\frac{3}{3}\right) + \left(-\frac{19}{3}\right)\left(\frac{8}{8}\right)$

$\frac{39}{24} + \left(-\frac{152}{24}\right) = \frac{-11}{24}$

$-4\frac{17}{24}$

g) $-\frac{17}{4} - \frac{11}{3}$

$-\frac{17}{4}\left(\frac{3}{3}\right) + \left(-\frac{11}{3}\right)\left(\frac{4}{4}\right)$

$-\frac{51}{12} + -\frac{44}{12} = \frac{-95}{12}$

$-7\ 11/12$

h) $3\frac{5}{6} - \left(-2\frac{2}{3}\right)$

$\frac{23}{6} + \left(\frac{8}{3}\right)\left(\frac{2}{2}\right)$

$\frac{23}{6} + \frac{16}{6} = \frac{39}{6}$

$6\frac{3}{6} \Rightarrow 6\frac{1}{2}$

6. Determine each product or quotient.

a) $(-14.6)(2.5)$ $14.6 \times 2.5 = -36.5$

b) $(-12.8)(-12.8)$ $+163.84$

c) $(-8.64) \div (-2.7)$ $+3.2$

d) $4.592 \div (-0.82)$ -5.6

e) $\left(\frac{9}{5}\right)\left(6\frac{1}{3}\right)$

$\frac{9}{5}\left(\frac{19}{3}\right) = \frac{171}{15}$

OR

$\frac{57}{5} = 11\frac{2}{5}$

f) $\left(-8\frac{3}{4}\right)\left(2\frac{2}{15}\right)$

$-\frac{35}{4} \times \frac{32}{15} = -\frac{1120}{60}$

$-\frac{56}{3} = -18\frac{2}{3}$

g) $\left(-\frac{5}{12}\right) \div \left(-8\frac{1}{3}\right)$

$-\frac{5}{12} \times \left(-\frac{3}{25}\right) = \frac{15}{300}$

OR

$+\frac{1}{20}$ look to simplify early

h) $\left(-3\frac{1}{5}\right) \div 2\frac{2}{3}$

$-\frac{16}{5} \div \frac{8}{3}$

$-\frac{16}{5} \times \frac{3}{8} = -\frac{48}{40}$

OR

$-\frac{6}{5} = -1\frac{1}{5}$

7. Evaluate

a) $\left(-\frac{7}{8}\right) - \left(\frac{1}{5} \div \left(-\frac{3}{10}\right)\right) - \frac{1}{4}$

$-\frac{7}{8} - \frac{1}{5} \times \frac{10}{-3} - \frac{1}{4}$

$-\frac{7}{8}\left(\frac{3}{3}\right) + \frac{2}{3}\left(\frac{8}{8}\right) - \frac{1}{4}\left(\frac{6}{6}\right)$

$-\frac{21}{24} + \frac{16}{24} - \frac{6}{24} = -\frac{11}{24}$

b) $(-2.1)(18.5) - 6.8 \div 4$

$-38.85 - 1.7$

-40.55

c) $\left(-7\frac{1}{3}\right)\left(\frac{6}{55}\right) + \left[1\frac{1}{2} \div \left(-\frac{2}{7}\right)\right]$

$-\frac{22}{3}\left(\frac{6}{55}\right)^2 + \frac{3}{2} \times \left(-\frac{7}{2}\right)$

$\left(\frac{4}{4}\right)\frac{-4}{5} + \left(-\frac{21}{4}\right)\left(\frac{5}{5}\right)$

$\frac{-16}{20} + \left(-\frac{105}{20}\right)$ → $\frac{-121}{20}$ → $-6\frac{1}{20}$

d) $2\frac{1}{4} - \left(-3\frac{7}{8} + 5\right)\left(\frac{4}{9} - 3\right)$

$\frac{9}{4} - \left(-\frac{31}{8} + \frac{40}{8}\right)\left(\frac{4}{9} - \frac{27}{9}\right)$

$\frac{9}{4} - \left(\frac{9}{8}\right)\left(\frac{-23}{9}\right)$

$\left(\frac{2}{2}\right)\frac{9}{4} - \left(\frac{-23}{8}\right)$

$\frac{18}{8} + \frac{23}{8}$ → $\frac{41}{8}$ → $5\frac{1}{8}$

8.

Two students were asked to evaluate: $(-8) - 2(24 \div (-8))^2$
Here are their calculations.

$(-8) - 2(24 \div (-8))^2$	$(-8) - 2(24 \div (-8))^2$
$= (-10)(24 \div (-8))^2$	$= (-8) - 2(-3)^2$ multiplied
$= (-10)(-3)^2$ subtracted	$= (-8) - (-6)^2$ before
$= (-10)(9)$ before	$= -8 - 36$ exponents
$= -90$ multiplied	$= -44$

Why did both these students get incorrect answers?
What is the correct answer?

$-8 - 2(-3)^2$
$-8 - 2(9)$
$-8 - 18$

The correct answer is $\rightarrow -26$.

9. To pay for a skiing holiday in Whistler, Paige borrowed $1450.50 from her parents. She pays back $30.75 each week. How many weeks will it be until Paige is no longer in debt? Justify your answer

$\$1450.50 \div \$30.75 = 47.17$

$47(30.75) = 1445.25$

$1450.50 - 1445.25$

She will need 48 weeks to pay off the loan entirely. 41 weeks isn't enough. She'd still have $5.25 owing.