SOLUTIONS

Math 466: Stuff you need to know by heart

Homework due next class, include the corrections found online.

❖ Indicate the definition for each type of numbers

$\mathbb{R}$
- $\mathbb{Z}$ ...-3,-2,-1,0,1,2,3... (Integers)
- $\mathbb{N}$ 0,1,2,3,4... (Natural Numbers)
- $\mathbb{Q}$ Rational Numbers (fractions)
- $\mathbb{Q}'$ Irrational Numbers.
- $\mathbb{W}$ Whole Numbers not including 0 ex: 1,2,3,4...

❖ Fractions: Calculate each operation

$\frac{1}{2}\overset{\times 9}{} + \frac{3}{9}\overset{\times 2}{} = \frac{9}{18} + \frac{6}{18} = \boxed{\frac{15}{18}}$

$\frac{1}{2}\overset{\times 3}{} - \frac{3}{6} = \frac{3}{6} - \frac{3}{6} = \boxed{0}$

$\frac{16}{25} \times \frac{100}{36} = \frac{1600}{900} = \boxed{\frac{16}{9}}$

$\frac{15}{27} \div \frac{25}{9} = \frac{15}{27} \times \frac{9}{25} = \frac{135}{675} = \boxed{\frac{1}{5}}$

$3\left(-\frac{6}{7}x\right) = \boxed{-\frac{18}{7}x}$

$\frac{4}{5}\left(\frac{3}{2}x\right) = \frac{12}{10}x = \boxed{\frac{6}{5}x}$

$\frac{3/2}{2/9} = \frac{3}{2} \div \frac{2}{9} = \frac{3}{2} \times \frac{9}{2} = \boxed{\frac{27}{4}}$

❖ Evaluate: Order of Operations with Fractions

11. $\left(-\frac{4}{7}\right) \div \left(-\frac{12}{7}\right) - \frac{1}{3} =$

$\left(\frac{-4}{7} \times \frac{-7}{12}\right) - \frac{1}{3}$

$\frac{28}{84} - \frac{1}{3} \Rightarrow \frac{1}{3} - \frac{1}{3} = \boxed{0}$

12. $4\frac{1}{2} \times \left(-\frac{2}{3}\right) + \frac{7}{8} =$

$\frac{9}{2} \times -\frac{2}{3} \div \frac{7}{8}$

$\frac{-18}{6} \times \frac{8}{7} = \frac{-144}{42} = \boxed{-\frac{1}{3}}$

13. $\frac{4}{9} + \frac{-3}{4} \times \frac{2}{9} \div \frac{3}{5} =$

$\frac{4}{9} \times \frac{4}{-3} \times \frac{2}{9} \times \frac{5}{3} = \frac{160}{-729}$

$= \boxed{\frac{-160}{729}}$

14. $\frac{1}{3} \times \frac{5}{8} + \frac{1}{4} \times \left(\frac{-1}{2}\right)$

$\frac{5}{24} + \frac{1}{4} \times -\frac{1}{2}$

$\frac{5}{24} + \frac{-1}{8}\overset{\times 3}{}$

$\frac{5}{24} - \frac{3}{24} = \frac{2}{24} = \boxed{\frac{1}{12}}$

❖ **Solve**

$\frac{2}{3}x + 7 = 4$

$-7 \quad -7$

$\frac{\frac{2}{3}x}{\frac{2}{3}} = \frac{-3}{\frac{2}{3}}$

$x = -3 \div \frac{2}{3}$

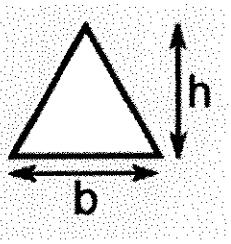
$= -3 \times \frac{3}{2} = \boxed{\frac{-9}{2}}$

$\frac{3}{4}x = \frac{6}{11}$

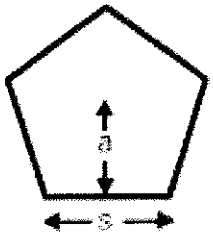
$x = \frac{6}{11} \div \frac{3}{4}$

$= \frac{6}{11} \times \frac{4}{3} = \frac{24}{33} = \boxed{\frac{8}{11}}$

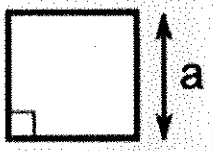
❖ **Write the formula for the area of the following 2D Shapes**



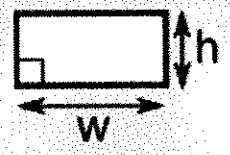
$A = \frac{b \times h}{2}$



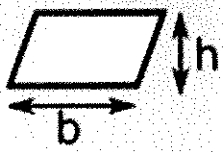
$A = \frac{s \cdot a \cdot n}{2}$



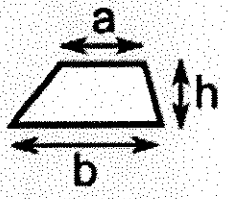
$A = a^2$



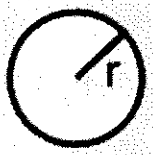
$A = w \times h$



$A = b \times h$



$A = \frac{(b+a) \cdot h}{2}$



$A = \pi r^2$

❖ Calculate 528 divided by 32 by **Long Division**

$$\begin{array}{r} 16.5 \\ 32\overline{)528.0} \\ -32\downarrow \\ \hline 208 \\ -192\downarrow \\ \hline 160 \\ 160 \\ \hline 0 \end{array}$$

Quotient: 16.5

❖ **Solve each equation and write your solution in proper notation.**

Case 1: $2x - 8 = 0$

$\frac{2x}{2} = \frac{8}{2}$

$\boxed{x = 4}$

Case 2: $2x + 3 = -3x + 5x - 6$

$2x + 3 = 2x - 6$

$2x - 2x + 3 = -6$

$3 = -6$ (NO SOLUTION)

Case 3: $3x - 8 = 2x + 1x - 5 - 3$

$3x - 8 = 3x - 8$

TRUE

$3x - 3x - 8 = -8$

$0 - 8 = -8$

$-8 = -8$ ✓

↳ $x \in \mathbb{R}$ (belongs to; can be any number)

❖ **Understand the different notations: $f(x)$ can be written as $s(x)$ which can be written as $h(t)$.**

❖ **Understand how to calculate and properly calculate $f(x)$ when $x = 5$.**

Regular Math	Enriched Math
$y = ax + b$	$f(x) = ax + b$
$y = 2x - 3$	$f(x) = 2x - 3$
$y = 2(5) - 3$	$f(\mathbf{5}) = 2(\mathbf{5}) - 3$

❖ **Find the time a ball takes to reach 19 m** if the height (in meters) of a ball as a function of time (in sec) follows the equation $h(t) = 2x^2 + 1$.

$t = ?$

$h(t) = 19m$

$h(t) = 2t^2 + 1$

$19 = 2t^2 + 1$

$\frac{18}{2} = \frac{2t^2}{2}$

$9 = t^2$

$\boxed{3 = t}$

❖ **Explain the notation $a > 0$**

a is positive