

1.2 Operations on Rational Numbers

PEMDAS

34. $-9 - |-7 - (-15)|$

$$= -9 - |8| = -9 - 8 = \boxed{-17}$$

$$\frac{3}{5} \cdot \frac{5}{9} = \frac{3 \cdot 5}{5 \cdot 9}$$

$$= \left(\frac{3}{5}\right)^2 = \frac{-9}{25}$$

110. $\left(-\frac{3}{5}\right)^2 - \frac{3}{5} \cdot \frac{5}{9} + \frac{7}{10}$

$$\frac{9}{25} - \frac{3}{5} \cdot \frac{5}{9} + \frac{7}{10}$$

$$\frac{9}{25} - \frac{1}{3} + \frac{7}{10}$$

LCM/
LCD = 150

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

$$\frac{-1}{-1} = +1$$

$$\frac{9}{25} \cdot \frac{6}{6} - \frac{1}{3} \cdot \frac{50}{50} + \frac{7}{10} \cdot \frac{15}{15}$$

$$= \frac{54}{150} - \frac{50}{150} + \frac{105}{150} = \frac{54 - 50 + 105}{150}$$

$$= \boxed{\frac{109}{150}}$$

1.3 Variable Expressions

$$a(b+c) = ab+ac$$

98. $5(3a - 2b) - 3(-6a + 5b)$

$$5(3a - 2b) + (-3)(-6a + 5b)$$

$$15a - 10b + 18a - 15b$$

$$\boxed{33a - 25b}$$

$$a-b = a+(-b)$$

100. $3x - 2[y - 2(x + 3[2x + 3y])]$

$$3x - 2[y - 2(x + 6x + 9y)]$$

$$3x - 2[y - 2(7x + 9y)]$$

$$3x - 2[y - 14x - 18y]$$

$$3x - 2[-14x - 17y]$$

$$3x + 28x + 34y$$

$$\boxed{31x + 34y}$$

$$\text{If } a + b = -9 \text{ and } x + y = -3,$$

$$\text{what is } -3b - 5x - 5y - 3a?$$

$$\begin{aligned} & -3a - 3b - 5x - 5y \\ & -3(a+b) - 5(x+y) \\ & -3(-9) - 5(-3) \\ & 27 + 15 \\ & \boxed{42} \end{aligned}$$

Transitive Property of Equality
If $a=b$ & $b=c$,
then $a=c$.

$$\text{If } 4a + 3b + c = 1 \text{ and } 5x + 3y = 7,$$

$$\text{what is } -35x + 24b - 21y + 32a + 8c?$$

$$\begin{aligned} & 32a + 24b + 8c - 35x - 21y \\ & 8(4a + 3b + c) - 7(5x + 3y) \\ & 8(1) - 7(7) \\ & 8 - 49 \\ & \boxed{-41} \end{aligned}$$

1.4 Verbal Expressions and Variable Expressions

Translate into a variable expression and simplify: "The sum of half of a number and 6 less than twice that number."

$$\frac{1}{2}x + (2x - 6)$$

$$\begin{aligned} \text{smaller} + \text{larger} &= 20 \\ x + \text{larger} &= 20 \\ \text{larger} &= 20 - x \end{aligned}$$

The sum of two numbers is 20. Using x to represent the smaller number, translate "the difference between five times the larger number and three less than the smaller number."

$$5(20 - x) - (x - 3)$$

2.1 Equations in One Variable

- An equation that is true for only some instances of the variable is called a conditional equation. $2x-3=5$
- An equation that is never true for any instances of the variable is called a contradiction. $2x-3=2x+5 \Rightarrow -3=5$ ~~✗~~
- An equation that is always true for any instance of the variable is called an identity. $2x-3=5x-3x+4-7 \Rightarrow -3=-3$
- One way to simplify an equation involving fractions is to get rid of the fractions by: multiplying both sides by the least common denominator.
- The solution set to a contradictory equation is the empty set.
- The solution set to an identity is all real numbers.

$$40. 7 + 8y - 12 = 3y - 8 + 5y$$

$$8y - 5 = 8y - 8$$

$$-5 = -8$$

no solution / \emptyset

$$\frac{6}{1} \cdot \left(\frac{2}{3}x - \frac{5}{6}x - 3 \right) = \left(\frac{1}{2}x - 5 \right) \cdot \frac{6}{1}$$

$$4x - 5x - 18 = 3x - 30$$

$$-x - 18 = 3x - 30$$

$$+30 + x \quad +x + 30$$

$$-18 + 30 = 3x + x$$

$$12 = 4x$$

$$\boxed{3 = x}$$

$$92. \frac{6}{\left(\frac{a}{7}\right)} = -18$$

$$\frac{6 \cdot a}{1 \cdot 7} = -18$$

$$\cancel{\frac{6}{6}} \cdot \frac{a}{7} = \cancel{-18} \cdot \frac{7}{7}$$

$$a = -21$$

$$96. \frac{4(x-5) - (x+1)}{3} = (x-7) \cdot 3$$

$$4x - 20 - x - 1 = 3x - 21$$

$$3x - 21 = 3x - 21$$

$$0 = 0$$

identity \Rightarrow all real #'s

For homework:

- work problems from 1.1 in the textbook (set notation)

- work toward mastery of all topics from Ch 1

(as listed <http://www.asms.net/brewer/intermediatealgebrasyllabus.html>)

12-Aug	1	1.1	Introduction to Real Numbers	<ul style="list-style-type: none"> Recognizing rational and irrational numbers Basic set notation Properties of numbers 1 Number properties terminology 1 Properties of numbers 2 Distributive property
		1.2	Operations on Rational Numbers	<ul style="list-style-type: none"> Order of operations Multi-step word problems with whole numbers Combining like terms Combining like terms with distribution Equivalent forms of expressions 1
		1.3	Variable Expressions	<ul style="list-style-type: none"> Evaluating expressions in one variable Evaluating expressions in 2 variables Expressions with unknown variables Expressions with unknown variables 2
		1.4	Verbal Expressions and Variable Expressions	<ul style="list-style-type: none"> Writing expressions Evaluating expressions 2 Writing expressions 2 Writing expressions 2

Upcoming:

Wednesday - word problems

Friday - quiz on Ch 1 Material

- work toward mastery of non-word problem topics from Ch 2

19-Aug	2	2.1	Equations in One Variable	<ul style="list-style-type: none"> One step equation intuition Solving equations and inequalities through substitution One step equations One-step equations with multiplication 2-step equations Equations with variables on both sides Solutions to linear equations Multi-step equations Multi-step equations with distribution
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