

Chapter 3	Expressions (no equal sign) and Equations (equal sign)
MAFS.7.EE.1.2	Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. For example, $a + 0.05a = 1.05a$ means that "increase by 5%" is the same as "multiply by 1.05."
Essential Question	What are terms and like terms and how do you identify them? In this lesson, I am <i>identifying terms and like terms in an expression by first writing the expression as a sum of its terms so I can later apply this to adding/subtracting expressions and solving equations.</i>
3.1 Algebraic Expressions	<p><u>Terms</u>: parts of an algebraic expression separated by a plus or minus</p> <p><u>Like Terms</u>: terms that have the same variable raised to the same exponent</p> <p><u>Constant Terms</u>: like terms without variables</p> <p><u>Simplest Form</u>: an expression with no like terms and no parenthesis</p>
Homework 3.1 Practice A #1-3	<p>Identify the terms and like terms in the expression.</p> <div> <p>1. $y + 10 + \frac{3}{2}y$ 3 terms: $y, 10, -\frac{3}{2}y$ Like terms: $y, -\frac{3}{2}y$</p> </div> <div> <p>2. $2r^2 + 7r + r^2 + 9$ 4 terms: $2r^2, 7r, -r^2, -9$ Like Terms: $2r^2, -r^2$</p> </div> <div> <p>3. $7 + 4p + 5 + p + 2q$ 5 terms: $7, 4p, -5, p, 2q$ Like Terms: $7, -5$ $4p, p$</p> </div>
Homework 3.1 Practice A #4-11	<p>Simplify the expression.</p> <div> <p>4. $14 + 3z + 8 + z$ $-2z + 22$</p> </div> <div> <p>5. $2.5x + 4.3x - 5$ $6.8x - 5$</p> </div> <div> <p>6. $\frac{3}{8}b - \frac{3}{4}b$ $\frac{3}{8}b + \frac{-6}{8}b$ $-\frac{3}{8}b$</p> </div>
Homework 3.1 Practice A #4-11	<p>Simplify the expression.</p> <div> <p>7. $3(q + 1) - 4$ $3q + 3 - 4$ $3q - 1$</p> </div> <div> <p>8. $-2(g + 4) + 7g$ $-2g - 8 + 7g$ $5g - 8$</p> </div> <div> <p>9. $7 - 4\left(\frac{3}{4}x - \frac{1}{4}\right)$ $7 - 3x + 1$ $8 - 3x$</p> </div>

MAFS.7.EE.1.1	Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.
Essential Question	<p>How can you simplify linear expressions?</p> <p>In this lesson, I will add or subtract linear expressions using a vertical or horizontal method of combining like terms so I can simplify the expression down to a variable term and constant term.</p>
3.2 Adding and Subtracting Linear Expressions	<p><u>Linear expression</u>: is an algebraic expression in which the exponent of the variable is 1.</p>
Homework 3.2 Practice A #1-8	<p>Find the sum.</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>1. $(x + 3) + (2x - 1)$</p> $\underline{x + 3} + \underline{2x - 1}$ $3x + 2$ </div> <div style="text-align: center;"> <p>2. $(-8z + 4) + (8z - 7)$</p> $\cancel{-8z + 4} + \cancel{8z - 7}$ -3 </div> </div> <div style="display: flex; justify-content: space-around; margin-top: 20px;"> <div style="text-align: center;"> <p>3. $(4 - n) + 2(-5n + 3)$</p> $4 - n + -10n + 6$ $-11n + 10$ </div> <div style="text-align: center;"> <p>4. $\frac{1}{2}(w - 6) + \frac{1}{4}(w + 12)$</p> $\frac{1}{2}w - 3 + \frac{1}{4}w + 3$ $\frac{2}{4}w + \frac{1}{4}w$ $\frac{3}{4}w$ </div> </div>
Homework 3.2 Practice A #10-15	<p>Find the difference.</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>5. $(m - 3) - (-m + 12)$</p> $\underline{m - 3} + \underline{m - 12}$ $2m - 15$ </div> <div style="text-align: center;"> <p>6. $-2(c + 2.5) - 5(1.2c + 4)$</p> $\underline{-2c - 5} + \underline{-6c - 20}$ $-8c - 25$ </div> </div>
	<p>What is the sum of the two expressions?</p> $\underline{\left(\frac{2}{5}x + 3\right)} + \underline{\left(\frac{1}{5}x - 1\right)}$ $\frac{3}{5}x + 2$

	<p>Find the difference of the two expressions.</p> $\left(\frac{2}{5}x + 5\right) - \left(\frac{1}{5}x - 3\right)$ $\frac{2}{5}x + 5 + -\frac{1}{5}x + 3$ $\frac{1}{5}x + 8$
	<p>An expression is shown.</p> $2\left(\frac{3}{5}x + 3\right) - \left(\frac{2}{3}x - 1\right)$ $\frac{6}{5}x + 6 - \frac{2}{3}x + 1$ <p>Create an equivalent expression without parentheses.</p> $\frac{18}{15}x + 7 - \frac{20}{15}x$ $\frac{8}{15}x + 7$
Factoring Expressions	<p><u>Factoring</u> means writing the expression as a product of its factors by dividing each term by the greatest common factor.</p>
Homework 3.2 extension #1-9	<p>Factor the expression using the GCF.</p> <div style="display: flex; flex-wrap: wrap;"> <div style="width: 50%;"> <p>1. $\frac{9}{3} + \frac{21}{3}$</p> $3(3+7)$ </div> <div style="width: 50%;"> <p>2. $\frac{32}{8} - \frac{48}{8}$</p> $16(2-3)$ </div> <div style="width: 50%;"> <p>3. $\frac{8x}{2} + \frac{2}{2}$</p> $2(4x+1)$ </div> <div style="width: 50%;"> <p>4. $\frac{3y}{3} - \frac{24}{3}$</p> $3(y-8)$ </div> <div style="width: 50%;"> <p>5. $\frac{20z}{4} - \frac{8}{4}$</p> $4(5z-2)$ </div> <div style="width: 50%;"> <p>6. $\frac{15w}{5} + \frac{65}{5}$</p> $5(3w+13)$ </div> <div style="width: 50%;"> <p>7. $\frac{36a}{4} + \frac{16b}{4}$</p> $4(9a+4b)$ </div> <div style="width: 50%;"> <p>8. $\frac{21m}{7} - \frac{49n}{7}$</p> $7(3m-7n)$ </div> </div>
Homework 3.2 extension #10-17	<p>Factor out the coefficient of the variable.</p> <div style="display: flex; flex-wrap: wrap;"> <div style="width: 50%;"> <p>9. $\frac{1}{3}b - \frac{1}{3}$</p> $\frac{1}{3}(b-1)$ </div> <div style="width: 50%;"> <p>10. $\frac{3}{8}d + \frac{3}{4}$</p> $\frac{3}{8}\left(d + \frac{24}{12}\right)$ $\frac{3}{8}(d+2)$ </div> <div style="width: 50%;"> <p>11. $\frac{2.2x}{2.2} + \frac{4.4}{2.2}$</p> $2.2(x+2)$ </div> <div style="width: 50%;"> <p>12. $\frac{4h}{4} - \frac{3}{4}$</p> $4\left(h - \frac{3}{4}\right)$ </div> </div>

MAFS.7.EE.2.4	Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations to solve problems by reasoning about the quantities.
Essential Question	How can you solve a one-step equation using addition/subtraction? In this lesson, I will use addition/subtraction properties of equality so I can solve one-step equations.
3.3 Solving Equations using Addition or Subtraction	<p>Two equations are <u>equivalent (equal) equations</u> if they have the same solutions.</p> <p>The <u>Addition Property of Equality</u>: adding the same number to both sides of an equation produces an equivalent equation.</p> <p>The <u>Subtraction Property of Equality</u>: subtracting the same number to both sides of an equation produces an equivalent equation.</p>
Homework 3.3 Practice A #1-12	<p>Solve the equation. Check your solution.</p> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> <p>1. $p - 5 = -2$</p> $\begin{array}{r l} p - 5 & = -2 \\ +5 & +5 \\ \hline p & = 3 \end{array}$ </div> <div style="text-align: center;"> <p>2. $w + 13.2 = 10.4$</p> $\begin{array}{r l} w + 13.2 & = 10.4 \\ -13.2 & -13.2 \\ \hline w & = -2.8 \end{array}$ $\begin{array}{r} 13.2 \\ -10.4 \\ \hline 2.8 \end{array}$ </div> <div style="text-align: center;"> <p>3. $x - \frac{5}{6} = -\frac{1}{6}$</p> $\begin{array}{r l} x - \frac{5}{6} & = -\frac{1}{6} \\ +\frac{5}{6} & +\frac{5}{6} \\ \hline x & = \frac{4}{6} \\ & = \frac{2}{3} \end{array}$ </div> </div>
	<p>4. A company has a profit of \$120.50 today. This profit is \$145.25 less than the profit P yesterday. Write an equation that can be used to find P.</p> $P - 145.25 = 120.50$ <p>5. WHAT IF? You have -12 points after Level 1. Your score is 27 points less than your friend's score. What is your friend's score?</p> $\begin{array}{r l} -12 & = f - 27 \\ +27 & +27 \\ \hline 15 & = f \end{array}$

MAFS.7.EE.2.4	Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations to solve problems by reasoning about the quantities.
Essential Question	How can you solve a one-step equation using multiplication/division? In this lesson, I will use multiplication/division properties of equality so I can solve one-step equations.
3.4 Solving Equations using Multiplication or Division	<p>The <u>Multiplication Property of Equality</u>: multiplying the same number to both sides of an equation produces an equivalent equation.</p> <p>The <u>Division Property of Equality</u>: dividing the same number to both sides of an equation produces an equivalent equation.</p>
Homework 3.4 Practice A #1-6	<p>Solve the equation. Check your solution.</p> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> $1. \cancel{5}x = -2(5)$ $x = -10$ </div> <div style="text-align: center;"> $2. \cancel{1}a = -24$ $a = 24$ </div> <div style="text-align: center;"> $3. 3 = \cancel{-1.5}n$ $-2 = n$ </div> </div>
Homework 3.4 Practice A #7-12	<p>Solve the equation. Check your solution.</p> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> $4. \cancel{\frac{3}{7}} - 14 = \frac{2}{3}x \left(\frac{3}{2}\right)$ $-21 = x$ </div> <div style="text-align: center;"> $5. \cancel{\frac{5}{8}} \cdot \frac{8}{5}b = 5 \left(\frac{-5}{8}\right)$ $b = \frac{-25}{8}$ $b = -3\frac{1}{8}$ </div> <div style="text-align: center;"> $6. \cancel{\frac{6}{3}} \cdot \frac{3}{8}h = -9 \left(\frac{8}{3}\right)$ $h = -24$ </div> </div>
	<p>7. The record low temperature in Hawaii is -0.15 times the record low temperature in Alaska. The record low temperature in Hawaii is 12°F. What is the record low temperature in Alaska?</p> $\cancel{-0.15}a = 12$ $\frac{-0.15}{-0.15} \quad \frac{-0.15}{-0.15}$ $a = -80$

MAFS.7.EE.2.3	Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically.
Essential Question	How can you solve a two-step equation? In this lesson, I will use properties of equality so I can solve two-step equations.
<p>3.5 Solving Two-Step Equations</p> <p>Homework 3.5 Practice A #1-9</p>	<p>Solve the equation. Check your solution.</p> <div> <div> <p>1. $2x + 12 = 4$</p> $\begin{array}{r} \cancel{12} \quad \cancel{-12} \\ 2x = -8 \\ \hline \frac{2x}{2} = \frac{-8}{2} \\ x = -4 \end{array}$ </div> <div> <p>2. $-5c + 9 = -16$</p> $\begin{array}{r} \cancel{9} \quad \cancel{-9} \\ -5c = -25 \\ \hline \frac{-5c}{-5} = \frac{-25}{-5} \\ c = 5 \end{array}$ </div> <div> <p>3. $3(x - 4) = 9$</p> $\begin{array}{r} 3x - 12 = 9 \\ \hline \cancel{+12} \quad \cancel{+12} \\ 3x = 21 \\ \hline \frac{3x}{3} = \frac{21}{3} \\ x = 7 \end{array}$ </div> </div>
<p>Homework 3.5 Practice A #10-12</p>	<p>Solve the equation. Check your solution.</p> <div> <div> <p>4. $\frac{m}{2} + 6 = 10$</p> $\begin{array}{r} \cancel{+6} \quad \cancel{-6} \\ \frac{m}{2} = 4 \\ \hline (2) \frac{m}{2} = 4(2) \\ m = 8 \end{array}$ </div> <div> <p>5. $-\frac{z}{3} + 5 = 9$</p> $\begin{array}{r} \cancel{+5} \quad \cancel{-5} \\ -\frac{z}{3} = 4 \\ \hline (-3) \frac{-z}{3} = 4(-3) \\ z = -12 \end{array}$ </div> <div> <p>6. $\frac{2}{5} + 4a = -\frac{6}{5}$</p> $\begin{array}{r} \cancel{-\frac{2}{5}} \quad \cancel{+\frac{2}{5}} \\ 4a = -\frac{8}{5} \\ \hline \frac{4a}{4} = \frac{-\frac{8}{5}}{4} \\ a = -\frac{8}{20} \\ a = -\frac{2}{5} \end{array}$ </div> </div>
<p>Homework 3.5 Practice A #16-18</p>	<p>Solve the equation. Check your solution.</p> <div> <div> <p>7. $4 - 2y + 3 = -9$</p> $\begin{array}{r} -2y + 7 = -9 \\ \hline \cancel{-7} \quad \cancel{+7} \\ -2y = -16 \\ \hline \frac{-2y}{-2} = \frac{-16}{-2} \\ y = 8 \end{array}$ </div> <div> <p>8. $7x - 10x = 15$</p> $\begin{array}{r} -3x = 15 \\ \hline \frac{-3x}{-3} = \frac{15}{-3} \\ x = -5 \end{array}$ </div> <div> <p>9. $-8 = 1.3m - 2.1m$</p> $\begin{array}{r} -8 = -0.8m \\ \hline \frac{-8}{-0.8} = \frac{-0.8m}{-0.8} \\ 10 = m \end{array}$ </div> </div>