

Equations Review Guide - Test on Friday

What you need to know & be able to do	Things to remember	Examples	
1. Solving One Step Equations	<ul style="list-style-type: none"> <li>Use Inverse operations</li> </ul>	a. Solve $\begin{array}{r} 5 + m = 2 \\ -5 \quad -5 \\ \hline m = -3 \end{array}$	b. Solve $\begin{array}{r} -7 \cdot \frac{x}{-7} = 3 \cdot -7 \\ \hline x = -21 \end{array}$
2. Solving Two Step Equations	<ul style="list-style-type: none"> <li>Use Inverse operations</li> </ul>	a. Solve $\begin{array}{r} \frac{x}{6} + 4 = 15 \\ -4 \quad -4 \\ \hline \frac{x}{6} = 11 \\ 6 \cdot \frac{x}{6} = 11 \cdot 6 \\ \hline x = 66 \end{array}$	b. Solve $\begin{array}{r} 3 \cdot \frac{x-4}{3} = -6 \cdot 3 \\ x-4 = -18 \\ +4 \quad +4 \\ \hline x = -14 \end{array}$
3. Solving Multi-Step Equations	<ul style="list-style-type: none"> <li>Use Inverse operations</li> </ul>	a. Solve $\begin{array}{r} -5(3+x) + 25 = 15 \\ -15 - 5x + 25 = 15 \\ 10 - 5x = 15 \\ -10 \quad -10 \\ \hline -5x = 5 \\ -5 \quad -5 \\ \hline x = -1 \end{array}$	b. Solve $\begin{array}{r} 3x - 6 = 12 - 3x \\ +3x \quad +3x \\ \hline 6x - 6 = 12 \\ +6 \quad +6 \\ \hline 6x = 18 \\ 6 \quad 6 \\ \hline x = 3 \end{array}$
4. Solving Equations with Infinite or No Solution		a. Solve $\begin{array}{r} 3(3x+1) = 5x + 3x + 9 \\ 9x + 3 = 8x + 9 \\ -8x \quad -8x \\ \hline x + 3 = 9 \\ -3 \quad -3 \\ \hline x = 6 \end{array}$	b. Solve $\begin{array}{r} 5(x+2) - 3x = -3(x-5) \\ 5x + 10 - 3x = -3x + 15 \\ 2x + 10 = -3x + 15 \\ +3x \quad +3x \\ \hline 5x + 10 = 15 \\ -10 \quad -10 \\ \hline 5x = 5 \\ 5 \quad 5 \\ \hline x = 1 \end{array}$
		c. Solve $\begin{array}{r} -4x + 2(5x-6) = -3x - 39 \\ -4x + 10x - 12 = -3x - 39 \\ 6x - 12 = -3x - 39 \\ +3x \quad +3x \\ \hline 9x - 12 = -39 \\ +12 \quad +12 \\ \hline 9x = -27 \\ 9 \quad 9 \\ \hline x = -3 \end{array}$	d. Solve $\begin{array}{r} -10n + 3(8+8n) = -6(n-4) \\ -10n + 24 + 24n = -6n + 24 \\ 14n + 24 = -6n + 24 \\ +6n \quad +6n \\ \hline 20n + 24 = 24 \\ -24 \quad -24 \\ \hline 20n = 0 \\ 20 \quad 20 \\ \hline n = 0 \end{array}$

<p>5. Creating Equations and Inequalities</p> <ul style="list-style-type: none"> <li>Define a variable for what you are solving for</li> <li>Look for key words</li> <li>Consecutive Integers: <math>x, x+1, x+2, \dots</math></li> <li>Consecutive Even/Odd Integers: <math>x, x+2, x+4, \dots</math></li> </ul>	<p>a. Alex belongs to a music club. In this club, students can buy a student discount card for \$19.95. This card allows them to buy CDs for \$3.95 each. After one year, Alex has spent \$63.40. How many CDs did Alex buy? <math>X</math>: # of CDs</p> $19.95 + 3.95x = 63.40$ $\begin{array}{r} 19.95 \\ -19.95 \\ \hline 3.95x = 43.45 \\ \frac{3.95x}{3.95} = \frac{43.45}{3.95} \\ x = 11 \text{ CDs} \end{array}$	<p>b. The Beach Shack rents boats for \$60 for the first three hours and \$30 for each additional hour after that. If you spent \$180, how many hours did you rent a boat? Create an equation and then solve.</p> <p>Equation: <math>60 + 30(x-3) = 180</math></p> $60 + 30x - 90 = 180$ $30x - 30 = 180$ $\frac{30x - 30}{+30 + 30} = \frac{180 + 30}{+30 + 30}$ $\frac{30x}{30} = \frac{210}{30}$ $x = 7$ <p><b>7 hours</b></p>
<p>6. Isolating a Variable (Literal Equations)</p> <ul style="list-style-type: none"> <li>Using the properties of equalities solve an equation with more than one variable for a chosen variable.</li> </ul>	<p>c. Three consecutive integers add up to 153. Find the three integers.</p> $x + x+1 + x+2 = 153$ $3x + 3 = 153$ $\begin{array}{r} 3x + 3 \\ -3 \quad -3 \\ \hline 3x = 150 \\ \frac{3x}{3} = \frac{150}{3} \\ x = 50 \end{array}$ <p><b>50, 51, 52</b></p>	<p>d. Three ODD integers add up to 381. Find the integers.</p> $x + x+2 + x+4 = 381$ $3x + 6 = 381$ $\begin{array}{r} 3x + 6 \\ -6 \quad -6 \\ \hline 3x = 375 \\ \frac{3x}{3} = \frac{375}{3} \\ x = 125 \end{array}$ <p><b>125, 127, 129</b></p>
	<p>a. Solve the equation for <math>h</math>:</p> $S = 2\pi r h$ $\frac{S}{2\pi r} = \frac{2\pi r h}{2\pi r}$ <p><b><math>h = \frac{S}{2\pi r}</math></b></p>	<p>b. Solve for <math>y</math>:</p> $8x - 4y = 16$ $\begin{array}{r} 8x - 4y \\ -8x \quad -8x \\ \hline -4y = -8x + 16 \\ \frac{-4y}{-4} = \frac{-8x + 16}{-4} \\ y = 2x - 4 \end{array}$ <p><b><math>y = 2x - 4</math></b></p>
	<p>c. Solve the equation for <math>a</math>:</p> $10 \cdot g = \frac{b+2a}{10} \cdot 10$ $10g = \frac{b+2a}{-b} \cdot 2$ $\frac{10g - b}{2} = \frac{2a}{2}$ <p><b><math>a = \frac{10g - b}{2}</math></b></p>	<p>d. The formula <math>a = 46c</math> gives the floor area <math>a</math> in square meters that can be wired using <math>c</math> circuits. Solve for <math>c</math>.</p> $\frac{a}{46} = \frac{46c}{46}$ <p><b><math>c = \frac{a}{46}</math></b></p>