Equations Review, Part 3

If an equation involves fractions, it is often easier to solve it if you first get rid of them. We do that by **multiplying** both sides of the equation **by the denominator of the fraction** (or by the LCM of the denominators). This is not absolutely necessary as a starting point, but it does make things much easier.

Example 1. $\frac{3}{4}a + 4 = 6$ $4(\frac{3}{4}a + 4) = 4 \cdot 6$ 3a + 16 = 24 a = 8/3 = 22/3 Note: the <i>entire</i> left side needs to be multiplied by 4. That is why we enclose it in parentheses.	Check: $\frac{3}{4} \cdot \frac{8}{3} + 4 \stackrel{?}{=} 6$ $\frac{8}{4} + 4 \stackrel{?}{=} 6$ $6 = 6 \checkmark$
Example 2. $-\frac{2}{5}(x+7) = -6$ · 5 $5 \cdot \left(-\frac{2}{5}\right)(x+7) = 5(-6)$ Next we simplify $5 \cdot (-2/5)$. $-2(x+7) = -30$ $\div (-2)$ x+7 = 15 $-7x = 8$	Check: $-\frac{2}{5}(8+7) \stackrel{?}{=} -6$ $-\frac{2}{5}(15) \stackrel{?}{=} -6$ $-6 = -6 \checkmark$

1. Find the errors in these solutions, and correct them.

i.

a.

$\frac{3}{8}y - 7 = 2$	· 8
3y-7 = 16	+ 7 ÷ 3
3y = 23	÷ 3
y = 23/3 = 72/3	

b.

$4(y+2) = \frac{13}{5}$	• 5
4y + 8 = 13	- 8 ÷ 4
4y = 5	÷4
y = 5/4 = 1	1 1⁄4

2. Solve the equations. Compare the three and how they are solved.

a. $\frac{1}{5}a + 7 = 3$	b. $\frac{1}{5}(a+7) = 3$	c. $-\frac{2}{5}(a+7) = 3$

3. Practice some more. Solve the equations.

a.	$2 = -\frac{9}{10}(4-x)$	b. $2(1-x) = \frac{5}{12}$	c. $2y-5 = -\frac{4}{7}$

4. Solve equations involving decimals, also. Use a calculator. Give your final answer rounded to two decimals.

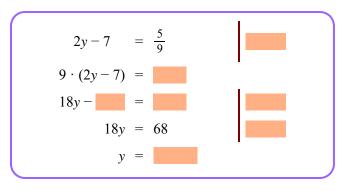
a. $0.4(x+5) = -3.7$	b. $4.72w - 8.9 = 20$	c. 98.5 = $-3(y+25.6)$

	Example 3. Here, the fraction is in a different spot in the equation. Multiplying by the denominator still works. However, you could also start the solution process by applying the distributive property on the left side.	$2(x + \frac{4}{5}) = -7$ $5 \cdot 2(x + \frac{4}{5}) = -35$ $10(x + \frac{4}{5}) = -35$ 10x + 8 = -35 10x = -43 $x = -\frac{43}{10} = -4\frac{3}{10}$	· 5 − 8 ÷ 3	
again, this tir	uation from example 4 ne starting the solution the distributive property de.	$2(x+\frac{4}{5}) = -$	7	
mixed number process. It is	onvert improper fractions to ers during the solution easier to calculate with n with mixed numbers.			

6. Solve. Compare the three and how they are solved. Again, keep any improper fractions during the process.

a. $-3(x+\frac{1}{6}) = 1$	b. $-3x + \frac{1}{6} = 1$	c. $-3x+1 = -\frac{1}{6}$

7. Fill in the missing parts — either what is to be done in the next step, or the missing numbers.



8. **a.** Verify that x = -4/3 is *not* a root of this equation.

 $6(x - \frac{2}{3}) = -2$ $6x - \frac{12}{3} = -12$ 6x - 4 = -12 6x = -8x = -8/6 = -4/3

b. Find the mistake in the solution, and correct it.

9. Here's a riddle to discover by solving the equations. Use blank paper if needed.

T $3(x+\frac{2}{9}) = -3$	R 2 = $\frac{1}{8}(7-x)$	A $-3x+6 = \frac{3}{5}$
H $0.2(6-s) = 50$	E $1.5 = 3(-T + 0.7)$	W $40 - 0.9x = 35.5$
Everyone always talks about it	5 0.2 1 4/5 -	-1 2/9 -244 0.2 -9

Everyone always talks about it,	5	0.2	1 4/5	-1 2/9	-244	0.2	-9
but no one does anything about it. What is it? The							