

Solve each equation. You don't need to check your work, *but you should*, before you hand in the test.

1. (5 pts) $4(x+1)+8=2(2x+7)-2$

$$4x+4+8 = 4x+14-2$$

$$4x+12 = 4x+12$$

All real #s
Identity
 $(-\infty, \infty)$

2. (10 pts) $5(6n+1)+3=10(3n-1)$

$$30n+5+3=30n-10$$

$$30n+8=30n-10$$

$$0=-18$$

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No sol'n

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3. (5 pts) $3(x-8)+x=3(x-6)+2$

$$3x-24+x=3x-18+2$$

$$4x-24=3x-16$$

$x=8$
 $x \in \{8\}$

4. (5 pts) $\frac{1}{4} + \frac{x}{18} = \frac{5}{6}$

$$\text{LCD} = 36$$

$$36\left(\frac{1}{4}\right) + 36\left(\frac{x}{18}\right) = 36\left(\frac{5}{6}\right)$$

$$9 + 2x = 30$$

$$2x = 21$$

$x = \frac{21}{2}$

$x \in \left\{ \frac{21}{2} \right\}$

5. (5 pts) $\frac{x+1}{3} - \frac{2-x}{8} = \frac{5}{6}$

$$\text{LCD} = 24$$

$$24\left(\frac{x+1}{3}\right) - 24\left(\frac{2-x}{8}\right) = 24\left(\frac{5}{6}\right)$$

$$8(x+1) - 3(2-x) = 4(5)$$

$$8x+8-6+3x=20$$

$$11x+2=20$$

$$11x=18$$

$x = \frac{18}{11}$

$x \in \left\{ \frac{18}{11} \right\}$

For word problems, I expect to see you assign your variable(s) in words (Let $x = \dots$) and for you to give the units (for instance, "in dollars").

6. (5 pts) If Sue can paint the kitchen in 5 hours and Ellen can paint the kitchen in 6 hours, how long will it take them to paint the kitchen if they work together?

Let $x =$ the # of hours it takes sue to get done, working with Ellen.

Then $\frac{1}{5}x + \frac{1}{6}x = 1$ job done.

Groups!

LCD = 30

$30(\frac{1}{5}x) + 30(\frac{1}{6}x) = 30(1)$

$6x + 5x = 30 \implies 11x = 30$

$x = \frac{30}{11}$ hrs

7. (5 pts) John bought a book in a New York bookstore for \$221.55 (with tax). What's the price of the book before tax, if New York sales tax is 5%?

Let $x =$ price of book before tax

Then $x + .05x = 221.55$

$1.05x = 221.55$

$x = \frac{221.55}{1.05}$

$= \$211.00$

Figure tax frontways a couple times.

8. (10 pts) **Recall:** The compound interest formula is $A = P\left(1 + \frac{r}{n}\right)^{nt}$, where

Fill in the blanks:

$A =$ amount in the account after t years = \$5808.92

$P =$ principal or amount invested = \$5,000

$t =$ time, in years = 5

$r =$ annual rate of interest = .03

$n =$ number of times compounded per year = 52

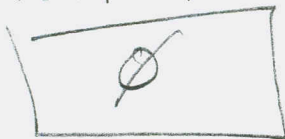
If a principal amount of \$5,000 is invested in an account paying an annual percentage rate of 3%, find the amount in the account after 5 years, if the account is compounded weekly.

$A = P\left(1 + \frac{r}{n}\right)^{nt} = 5000\left(1 + \frac{.03}{52}\right)^{(52)(5)} \approx 5808.919957$

\approx \$5,808.92

Solve.

9. (5 pts) $|3x - 7| = -5$



10. (5 pts) $|3x - 7| = 5$

$$3x - 7 = 5 \quad \text{OR} \quad 3x - 7 = -5$$

$$3x = 12 \quad \text{OR} \quad 3x = 2$$

$$x = 4 \quad \text{OR} \quad x = \frac{2}{3}$$

$$x \in \left\{ \frac{2}{3}, 4 \right\}$$

11. (10 pts) $|3x - 5| = |4x + 2|$

$$3x - 5 = 4x + 2 \quad \text{OR} \quad 3x - 5 = -(4x + 2)$$

$$-x = 7$$

$$3x - 5 = -4x - 2$$

$$7x = 3$$

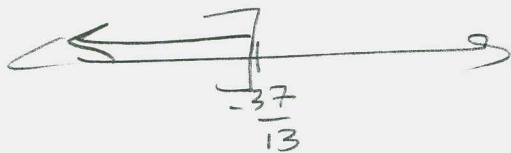
$$x = -7 \quad \text{OR} \quad x = \frac{3}{7}$$

$$x \in \left\{ -7, \frac{3}{7} \right\}$$

Solve. Write the final answer in interval notation. Leave fractions as fractions in lowest terms, even if they are improper fractions.

12. (5 pts) $-13x \geq 37$

$$x \leq -\frac{37}{13}$$



$$x \in \left(-\infty, -\frac{37}{13}\right]$$

13. (5 pts) $\frac{5x-3}{2} - \frac{11x+1}{9} \geq 5$

LCD = 18

$$18\left(\frac{5x-3}{2}\right) - 18\left(\frac{11x+1}{9}\right) \geq 18(5)$$

$$9(5x-3) - 2(11x+1) \geq 90$$

$$45x - 27 - 22x - 2 \geq 90$$

$$23x - 29 \geq 90$$

$$23x \geq 119$$

$$x \geq \frac{119}{23}$$

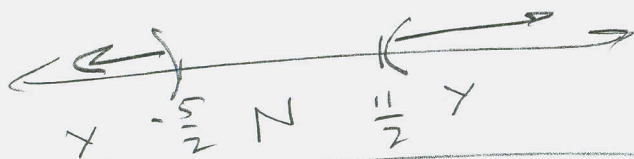
$$x \in \left[\frac{119}{23}, \infty\right)$$

14. (5 pts) $|2x-3| > 8$

$$2x-3 > 8 \text{ OR } 2x-3 < -8$$

$$2x > 11 \text{ OR } 2x < -5$$

$$x > \frac{11}{2} \text{ OR } x < -\frac{5}{2}$$



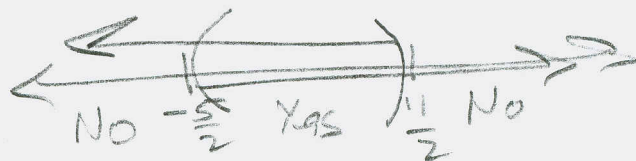
$$x \in \left(-\infty, -\frac{5}{2}\right) \cup \left(\frac{11}{2}, \infty\right)$$

16. (5 pts) $|2x-3| < 8$

$$2x-3 < 8 \text{ and } 2x-3 > -8$$

$$2x < 11 \text{ and } 2x > -5$$

$$x < \frac{11}{2} \text{ and } x > -\frac{5}{2}$$



$$x \in \left(-\frac{5}{2}, \frac{11}{2}\right)$$

15. (5 pts) $|2x-3| > -8$

$$(-\infty, \infty)$$

17. (5 pts) $|2x-3| < -8$

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