

★ REVIEW: change words  $\Rightarrow$  numbers & symbols

### Translating Phrases - Linear Expression

ES1

Translate each verbal phrase into an algebraic expression:

1) The sum of  $x$  and 2

$$\underline{x + 2}$$

2)  $t$  divided by 8

$$\underline{t \div 8}$$

3) The product of 9 and  $m$

$$\underline{9 \times m}$$

4) Subtract 5 from  $c$

$$\underline{c - 5}$$

5) Combine  $y$  and 7

$$\underline{7y}$$

6) Three-sevenths of  $h$

$$\underline{\frac{3}{7}h}$$

7) 3 multiplied by  $d$

$$\underline{3d}$$

8) One-quarter added to  $n$

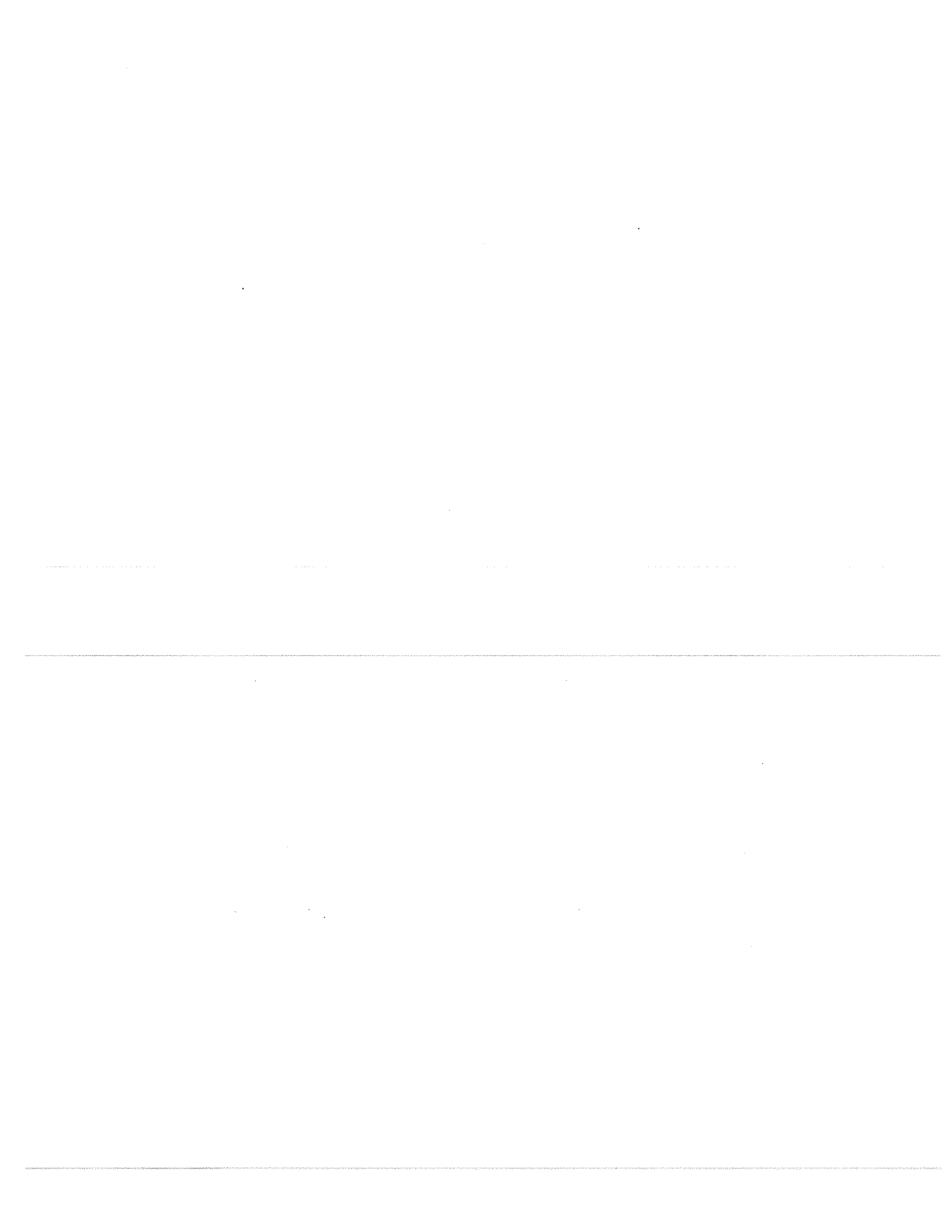
$$\underline{n + \frac{1}{4}}$$

9)  $b$  decreased by 10

$$\underline{b - 10}$$

10) One-half of  $k$

$$\underline{\frac{k}{2}}$$



NAME: answers

# U4:L1 Algebra Review

\*\*\*Use highlighters, pencil crayons or markers to color coordinate and doodle on the notes to help remember\*\*\*

Operation	Inverse
+	-
-	+
x	÷
÷	x
$x^2$	$\sqrt{x}$

When solving problems algebraically, you always...

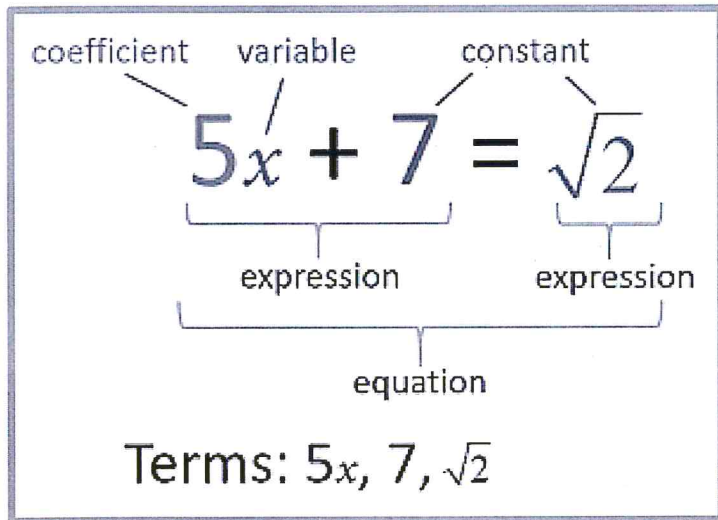
- 1) Do the inverse operation.
- 2) Do the same to both sides of the equal sign.

Examples:

$\begin{array}{r} x - 4 = 10 \\ +4 \quad +4 \\ \hline x = 14 \end{array}$	$\begin{array}{r} y + 2 = 12 \\ -2 \quad -2 \\ \hline y = 10 \end{array}$	$\begin{array}{r} 4x = 200 \\ \frac{4x}{4} = \frac{200}{4} \\ \hline x = 50 \end{array}$	$\begin{array}{r} 2x \frac{a}{2} = 7 \times 2 \\ \hline a = 14 \end{array}$
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Your turn:

$\begin{array}{r} m - 5 = 10 \\ +5 \quad +5 \\ \hline m = 15 \end{array}$	$\begin{array}{r} b + 20 = 90 \\ -20 \quad -20 \\ \hline b = 70 \end{array}$	$\begin{array}{r} 5x = 150 \\ \frac{5x}{5} = \frac{150}{5} \\ \hline x = 30 \end{array}$	$\begin{array}{r} 9x \frac{a}{9} = 7 \times 9 \\ \hline a = 63 \end{array}$
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**Remember...**

**Equation has an equal sign (=)**

**Expression does not**

1. Match the following terms to their definitions:

<b>CONSTANT</b>		A math phrase with an equals sign
<b>EXPRESSION</b>		A math phrase without an equals sign.
<b>EQUATION</b>		The <b>unknown</b> term (often expressed as a <b>LETTER</b> )
<b>VARIABLE</b>		A quantity that does not change (usually a <b>NUMBER!</b> )

*Note: Red arrows in the original image indicate the following matches: CONSTANT to 'A quantity that does not change...', EXPRESSION to 'A math phrase without an equals sign.', EQUATION to 'A math phrase with an equals sign.', and VARIABLE to 'The unknown term...'.*

2. Fill out the following table:

	VARIABLES	CONSTANTS	(CIRCLE ONE)
$x + 4$	$x$	4	EQUATION / <b>EXPRESSION</b>
$a + b + 7$	$a, b$	7	EQUATION / <b>EXPRESSION</b>
$44 = 11 + f$	$f$	44, 11	<b>EQUATION</b> / EXPRESSION
$10 + 13 = 23$		10, 13, 23	<b>EQUATION</b> / EXPRESSION
$4 + 7$		4, 7	EQUATION / <b>EXPRESSION</b>

# Solving TWO Step Equations

Solving two step equations follows the same steps as one step equations.

1) Do the **inverse** operation.

2) Do the same to both sides of the equal sign.

What inverse operation do I do first???

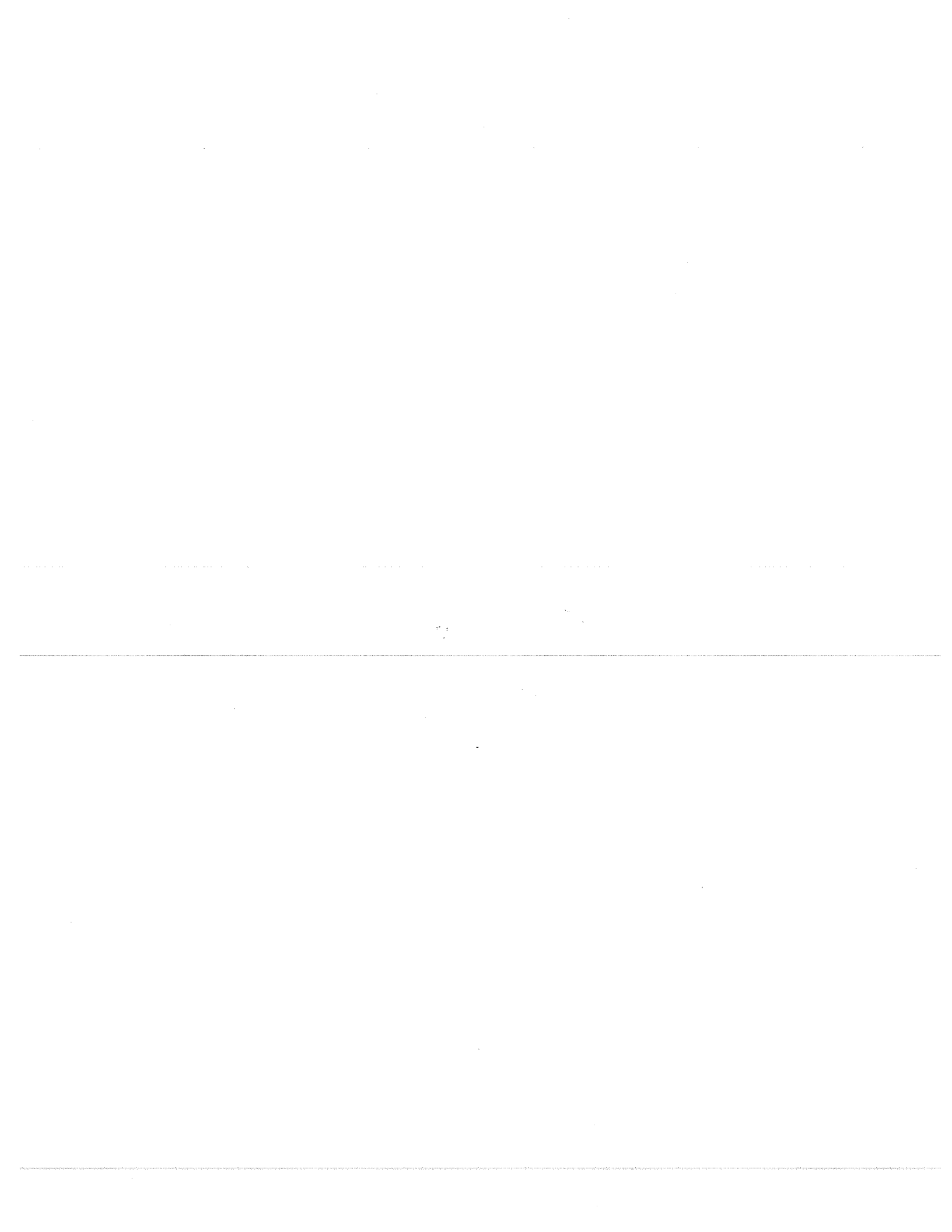
**BEDMAS backwards ... SAMDEB**

Examples:

$3m - 5 = 10$ $\begin{array}{c} +5 \quad +5 \\ \hline 3m = 15 \\ \hline \frac{3m}{3} = \frac{15}{3} \\ \hline m = 5 \end{array}$	$2b + 10 = 90$ $\begin{array}{c} -10 \quad -10 \\ \hline 2b = 80 \\ \hline \frac{2b}{2} = \frac{80}{2} \\ \hline b = 40 \end{array}$	$5x - 5 = 150$ $\begin{array}{c} +5 \quad +5 \\ \hline 5x = 155 \\ \hline \frac{5x}{5} = \frac{155}{5} \\ \hline x = 31 \end{array}$	$\frac{a}{9} = 7 + 3$ $\begin{array}{c} \times 9 \quad \times 9 \\ \hline a = 10 \times 9 \\ \hline a = 90 \end{array}$
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Your turn:

$5 + 2q = 11$ $\begin{array}{c} -5 \quad -5 \\ \hline 2q = 6 \\ \hline \frac{2q}{2} = \frac{6}{2} \\ \hline q = 3 \end{array}$	$\frac{b}{2} + 10 = 70$ $\begin{array}{c} -10 \quad -10 \\ \hline \frac{b}{2} = 60 \\ \hline \times 2 \quad \times 2 \\ \hline b = 120 \end{array}$	$5 = 150 + 5c$ $\begin{array}{c} -150 \quad -150 \\ \hline -145 = 5c \\ \hline \frac{-145}{5} = \frac{5c}{5} \\ \hline -29 = c \end{array}$	$8 \times 7 = \frac{2a}{8} \times 8$ $\begin{array}{c} \times 8 \quad \times 8 \\ \hline 56 = \frac{2a}{2} \\ \hline 28 = a \end{array}$
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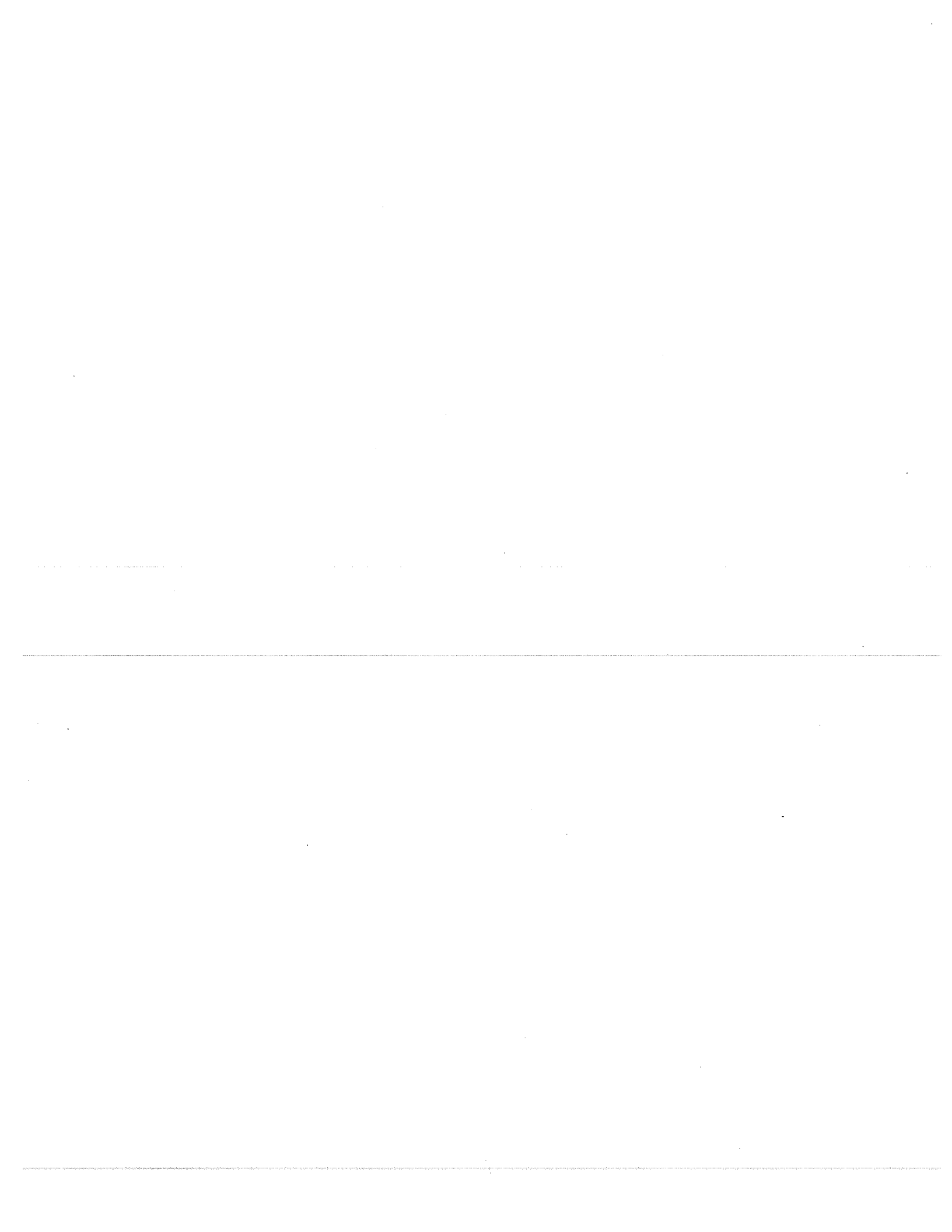


# Answers

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Topic:	Class:
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Main Ideas/Questions	Notes/Examples
<b>One-Step Equations</b>	1. $m + 12 = 10$ $\begin{array}{r} -12 \quad -12 \\ \hline m = -2 \end{array}$
	2. $-2 = g - 9$ $\begin{array}{r} +9 \quad +9 \\ \hline 7 = 9 \end{array}$
	3. $\frac{-7y}{-7} = \frac{-91}{-7}$ $y = 13$
	4. $\frac{a}{9} = -4 \cdot 9$ $a = -36$
<b>Fractions</b>  To "get rid" of a fraction, multiply by the reciprocal!	5. $\frac{3}{2} \cdot \frac{2}{3}x = 10 \cdot \frac{3}{2}$ $x = 15$
	6. $\frac{9}{4} \cdot \frac{4}{9}w = -8 \cdot \frac{9}{4}$ $w = -18$
	7. $\frac{-5}{6} \cdot \frac{6}{5}k = 12 \cdot \frac{-5}{6}$ $k = -10$
	8. $^{-2} \cdot \frac{1}{2}m = -9 \cdot ^{-2}$ $m = 18$
<b>Two-Step Equations</b>	<b>To Solve a Two-Step Equation:</b> 1. Undo the Addition/Subtraction (to remove constant term) 2. Undo the Multiplication/Division (to remove coefficient)
	9. $6x + 8 = 50$ $\begin{array}{r} -8 \quad -8 \\ \hline 6x = 42 \\ \frac{6x}{6} = \frac{42}{6} \\ x = 7 \end{array}$
	10. $2n - 5 = 11$ $\begin{array}{r} +5 \quad +5 \\ \hline 2n = 16 \\ \frac{2n}{2} = \frac{16}{2} \\ n = 8 \end{array}$
	11. $13 = -4k + 9$ $\begin{array}{r} -9 \quad -9 \\ \hline 4 = -4k \\ \frac{4}{-4} = \frac{-4k}{-4} \\ k = -1 \end{array}$
	12. $7 - 3y = 34$ $\begin{array}{r} -7 \quad -7 \\ \hline -3y = 27 \\ \frac{-3y}{-3} = \frac{27}{-3} \\ y = -9 \end{array}$





$$13. \frac{x}{2} - 7 = 9$$

$$\begin{array}{r} \phantom{x} \\ +7 \quad +7 \\ \hline \end{array}$$

$$2 \cdot \frac{x}{2} = 16 \cdot 2$$

$$\boxed{x = 32}$$

$$14. 11 = \frac{c}{-5} + 8$$

$$\begin{array}{r} \phantom{c} \\ -8 \quad -8 \\ \hline \end{array}$$

$$-5 \cdot 3 = \frac{c}{-5} \cdot -5$$

$$\boxed{-15 = c}$$

$$15. \frac{3}{5}x + 22 = 28$$

$$\begin{array}{r} \phantom{x} \\ -22 \quad -22 \\ \hline \end{array}$$

$$\frac{5}{3} \cdot \frac{3}{5} x = 6 \cdot \frac{5}{3}$$

$$\boxed{x = 10}$$

$$16. -\frac{1}{3}m + 1 = -7$$

$$\begin{array}{r} \phantom{m} \\ -1 \quad -1 \\ \hline \end{array}$$

$$-3 \cdot -\frac{1}{3}m = -8 \cdot -3$$

$$\boxed{m = 24}$$

$$17. -10 \div \frac{7}{4}p = -38$$

$$\begin{array}{r} \phantom{p} \\ +10 \quad +10 \\ \hline \end{array}$$

$$\frac{4}{7} \cdot \frac{7}{4} p = -28 \cdot \frac{4}{7}$$

$$\boxed{p = -16}$$

$$18. 15 = 9 - \frac{1}{2}x$$

$$\begin{array}{r} \phantom{x} \\ -9 \quad -9 \\ \hline \end{array}$$

$$-2 \cdot 6 = -\frac{1}{2}x \cdot -2$$

$$\boxed{-12 = x}$$

Watch Out!

The examples below are different in that the multiplication/division is done FIRST, followed by the addition/subtraction.

$$19. \frac{x+11}{8} = -3 \cdot 8$$

$$\begin{array}{r} x+11 = -24 \\ -11 \quad -11 \\ \hline \end{array}$$

$$\boxed{x = -35}$$

$$20. \frac{n-5}{-2} = -7 \cdot -2$$

$$\begin{array}{r} n-5 = 14 \\ +5 \quad +5 \\ \hline \end{array}$$

$$\boxed{n = 19}$$

$$21. 1 = \frac{a-13}{-6} \cdot -6$$

$$\begin{array}{r} -6 = a-13 \\ +13 \quad +13 \\ \hline \end{array}$$

$$\boxed{7 = a}$$

$$22. 4 = \frac{w+8}{9} \cdot 9$$

$$\begin{array}{r} 36 = w+8 \\ -8 \quad -8 \\ \hline \end{array}$$

$$\boxed{28 = w}$$

