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3.8: Rewrite Formulas and Equations
"I WILL …
Rewrite Formulas, Equations, and Functions."

I. Literal Equations

A. A literal equation is an equation that has more than one variable

B. *Literal* in Latin means "letter."

C. Solve for the missing variable and substitute

II. Steps

A. Move the term and variables onto one side

B. Isolate the variable

C. Simplify

D. Check

III. Model Problems

Ex 1: Solve $ax + b = c$ for x. Then, use the solution to solve, $2x + 5 = 11$.	Ex 2: Solve $a - bx = c$ for x. Then, use the solution to solve, $12 - 5x = -3$.
Ex 3: Solve $3x + 2y = 8$ so that y is a function of x.	Your Turn: Solve $-2x + 3y = 6$ so that y is a function of x.

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Ex 4: The area A of a triangle is given by the formula, $A = 1/2bh$ where b is the base and h is the height. A) Solve for the formula of h and B) Determine the height when the area is 64.4 meters^2 and the base is 14 m.	Ex 5: The perimeter P of a rectangle is given by the formula, $P = 2l + 2w$. A) Solve for the formula of w and B) Determine the width of the rectangle using the figure below. **P = 19.2 feet** **7.2 ft.**

Your Turn: The area A of a rectangle is given by the formula, $A = lw$ where l is the length and w is the width. A) Solve for the formula of l and B) Determine the length when the area is 351 cm.^{2} and the length is 13 cm.

A = 351 cm.^{2} **13 cm.**

Assignment: Pg 187: 4-30 odd

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LITERAL EQUATIONS **Solve the literal equation for x. Then use the solution to solve the specific equation.**

3. $ax = bx - c; 8x = 3x - 10$

4. $a(x + b) = c; 2(x + 1) = 9$

5. $c = \frac{x + a}{b}; 2 = \frac{x + 5}{7}$

6. $\frac{x}{a} = \frac{b}{c}; \frac{x}{8} = \frac{4.5}{12}$

7. $\frac{x}{a} + b = c; \frac{x}{4} + 6 = 13$

8. $ax + b = cx - d; 2x + 9 = 7x - 1$

ERROR ANALYSIS ***Describe*** **and correct the error in solving the equation for x.**

9.

$ax + b = 0$

$ax = b$

$x = \frac{b}{a}$

10.

$c = ax - bx$

$c = (a - b)x$

$c(a - b) = x$

REWRITING EQUATIONS **Write the equation so that y is a function of x.**

11. $2x + y = 7$

12. $5x + 4y = 10$

13. $12 = 9x + 3y$

14. $18x - 2y = 26$

15. $14 = 7y - 6x$

16. $8x - 8y = 5$

17. $30 = 9x - 5y$

18. $3 + 6x = 11 - 4y$

19. $2 + 6y = 3x + 4$

REWRITING FORMULAS **Solve the formula for the indicated variable.**

20. Volume of a rectangular prism: $V = \ell wh$. Solve for w.

21. Surface area of a prism: $S = 2B + Ph$. Solve for h.

22. Length of movie projected at 24 frames per second: $\ell = 24f$. Solve for f.

Animated Algebra at classzone.com

23. **TAKS REASONING** The formula for the area of a trapezoid is $A = \frac{1}{2}(b_1 + b_2)h$. Which equation is *not* equivalent to the formula?

Ⓐ $h = \frac{2A}{b_1 + b_2}$ Ⓑ $b_1 = \frac{2A}{h} - b_2$ Ⓒ $b_2 = \frac{2A}{b_1} - h$ Ⓓ $b_2 = \frac{2A}{h} - b_1$

REWRITING EQUATIONS **Write the equation so that y is a function of x.**

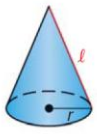
24. $4.2x - 2y = 16.8$

25. $9 - 0.5y = 2.5x$

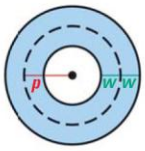
26. $8x - 5x + 21 = 36 - 6y$

GEOMETRY **Solve the formula for the indicated variable. Then evaluate the rewritten formula for the given values. (Use 3.14 for π.)**

27. Surface area of a cone: $S = \pi r\ell + \pi r^2$. Solve for ℓ. Find ℓ when $S = 283$ cm^2 and $r = 5$ cm.



28. Area of a circular ring: $A = 4\pi pw$. Solve for p. Find p when $A = 905$ ft^2 and $w = 9$ ft.



29. **TAKS REASONING** *Describe* a real-world situation where you would want to solve the distance traveled formula $d = rt$ for t.

CHALLENGE **Solve the literal equation for a.**

30. $x = \frac{a + b + c}{ab}$

31. $y = x\left(\frac{ab}{a - b}\right)$