

Formula Focus

Rearrange equations to isolate the quantity you need.

HIGH SCHOOL • HSA-CED.A.4

CCSS.Math.Content.HSA-CED.A.4 "Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law $V = IR$ to highlight resistance R ."

NAME _____

DATE _____

ISOLATE THE TARGET

To highlight a quantity, undo operations in reverse order while doing the same operation to both sides. Keep the target variable alone, then simplify the expression if needed.

WORKED EXAMPLE

Rearrange $Q = (k + 13)/8$ to highlight k .

1. Multiply both sides by 8: $8Q = k + 13$
2. Subtract 13 from both sides: $8Q - 13 = k$
3. Write the target first: $k = 8Q - 13$

Answer: $k = 8Q - 13$

PRACTICE 6 problems

1 Rearrange $d = rt$ to highlight t .

ANSWER _____

2 Rearrange $P = 2l + 2w$ to highlight w .

ANSWER _____

3 Rearrange $F = ma$ to highlight m .

ANSWER _____

4 Rearrange $y = (3/5)x - 4$ to highlight x .

ANSWER _____

5 Rearrange $V = IR$ to highlight R .

ANSWER _____

6 Rearrange $A = (1/2)bh$ to highlight h .

ANSWER _____

APPLY IT Show your work

- 1** A streaming plan follows the formula $B = 6g + 18$, where B is the monthly bill in dollars and g is the number of gigabytes used. First rearrange the formula to highlight g . Then find g when $B = 48$.

WORK SPACE

ANSWER _____

- 2** The student council designs a rectangular stage backdrop with perimeter $P = 2l + 2w$. First rearrange the formula to highlight l . Then find l when $P = 54$ feet and $w = 11$ feet.

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

Rearrange $q = (3x - 5)/(x + 2)$ to highlight x . State one value that q cannot equal.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Rearrange $d = rt$ to highlight t .	$t = d/r$
2	Rearrange $P = 2l + 2w$ to highlight w .	$w = (P - 2l)/2$
3	Rearrange $F = ma$ to highlight m .	$m = F/a$
4	Rearrange $y = (3/5)x - 4$ to highlight x .	$x = 5(y + 4)/3$
5	Rearrange $V = IR$ to highlight R .	$R = V/I$
6	Rearrange $A = (1/2)bh$ to highlight h .	$h = 2A/b$

PART 2 • APPLY IT

1. $g = (B - 18)/6$; $g = 5$ Subtract 18 from both sides, then divide by 6 to get $g = (B - 18)/6$. Substitute 48 for B to get $g = 5$.
2. $l = (P - 2w)/2$; $l = 16$ feet Subtract $2w$ from both sides, then divide by 2 to get $l = (P - 2w)/2$. Substitute 54 for P and 11 for w to get $l = 16$ feet.

CHALLENGE

$$x = (2q + 5)/(3 - q), \text{ where } q \neq 3$$

Accept algebraically equivalent forms, such as $w = P/2 - l$. For the challenge, accept $x = -(2q + 5)/(q - 3)$ with the restriction $q \neq 3$.