LESSON MAKER PRO

# Formula Flip Lab

*Rearrange equations to make the needed quantity stand alone.*

**HIGH SCHOOL · MA.912.AR.1.2**

**MA.912.AR.1.2** "Rearrange equations or formulas to isolate a quantity of interest."

NAME _____ DATE _____

## ISOLATE THE TARGET

To isolate a quantity, use inverse operations to undo the operations around it. Do the same operation to both sides, and keep simplifying until the target variable is alone.

**WORKED EXAMPLE**

In $C = (5/9)(F - 32)$, isolate F.

1. Multiply both sides by 9/5: $(9/5)C = F - 32$.
2. Add 32 to both sides: $(9/5)C + 32 = F$.
3. Write the isolated quantity first: $F = (9/5)C + 32$.

**Answer: $F = (9/5)C + 32$**

## PRACTICE 6 problems

**1** In A = lw, isolate w.

**ANSWER** _____

**2** In d = rt, isolate r.

**ANSWER** _____

**3** In V = Bh/k, isolate h.

**ANSWER** _____

**4** In P = 2l + 2w, isolate w.

**ANSWER** _____

**5** In y = (x - a)/b, isolate x.

**ANSWER** _____

**6** In q = 7p - 4, isolate p.

**ANSWER** _____

## APPLY IT Show your work

**1** A music app charges a one-time setup fee of $18 plus $6 for each month. The total charge is modeled by T = 18 + 6m. If the total charge is $42, how many months did the subscription cover?

WORK SPACE

**ANSWER** _____

**2** A student club earns $15 for each T-shirt sold and pays $24 for supplies. Its profit is modeled by E = 15s - 24. If the profit is $81, how many T-shirts were sold?

WORK SPACE

**ANSWER** _____

## CHALLENGE One step up

**CHALLENGE**

The reciprocal of a device's total resistance R is modeled by 1/R = 1/x + 1/y. Rearrange the equation to isolate x.

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_____

**ANSWER KEY**

# Formula Flip Lab

**HIGH SCHOOL · MA.912.AR.1.2**

## PART 1 · PRACTICE

| # | PROBLEM | ANSWER |
|---|---|---|
| 1 | In A = lw, isolate w. | **w = A/l** |
| 2 | In d = rt, isolate r. | **r = d/t** |
| 3 | In V = Bh/k, isolate h. | **h = kV/B** |
| 4 | In P = 2l + 2w, isolate w. | **w = (P - 2l)/2** |
| 5 | In y = (x - a)/b, isolate x. | **x = by + a** |
| 6 | In q = 7p - 4, isolate p. | **p = (q + 4)/7** |

## PART 2 · APPLY IT

1. **m = 4 months** Substitute 42 for T to get 42 = 18 + 6m. Subtract 18, then divide by 6.
2. **s = 7 T-shirts** Substitute 81 for E to get 81 = 15s - 24. Add 24, then divide by 15.

## CHALLENGE

**x = Ry/(y - R)**

Accept algebraically equivalent forms, such as A/l for w or (q + 4)/7 for p. For the challenge, require nonzero quantities and y not equal to R.