TI-*nspire*™

## Solving Literal Equations

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### Activity overview

*Students will look at literal equations and investigate how to solve them for different variables.*

### Concepts

- *Literal Equations*
- *Solving Equation, including Multistep equations*

### Step-by-step directions

*Open the LiteralEquations document on the Nspire handheld.*
(⌂)(7) *LiteralEquations*

(ctrl) ▶ to get to page1.2 of your document.

Read this page and see if you have any questions for your teacher. Make any notes needed here.

(ctrl) ▶ to get to page 1.3 of your document.

Write the definition of a literal equation in the space below.

A literal equation is:

Write an example of an equation that you think would be classified as a literal equation.

Swap papers with a partner and examine each other's example and make a comment if you agree or disagree and why. Be specific.

(ctrl) ▶ to get to page 1.4 of your document.

 Copy each of the given examples down in the spaces on the left below.

**FORMULA**          **VARIABLE(S) USED**          **WHAT EACH VARIABLE STANDS FOR**

_____          _____          _____

_____          _____          _____

_____          _____          _____

_____          _____          _____

_____          _____          _____

_____          _____          _____

_____          _____          _____

**Check answers with your teacher or partner before continuing.**

(ctrl) ▶ to get to page 1.5 of your document.

In the upper left corner of this screen you will find the directions. In the bottom left you will see a rectangle with measures. In the right half of the screen is a calculator page. Use the (ctrl)(tab) to maneuver from area to area on the screen.



Formula:                _____

Substitution:           _____

Answer with unit:       _____
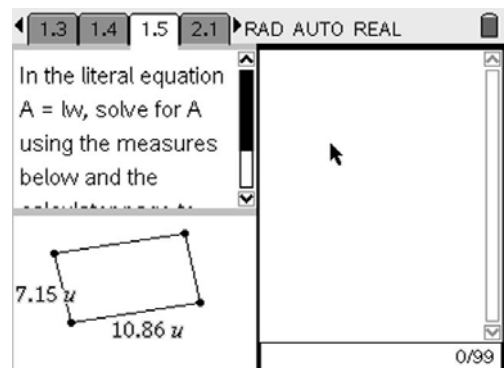
Did you show all of your work? Let your teacher or partner check it.

Now check your answer with the measurement tool.

Using the measurement tool:

⬡menu ⟨7⟩ ⟨2⟩

move the arrow over the rectangle until the rectangle flashes
and it says rectangle. You will also have a hand with a finger
pointing to the rectangle. Once you know you have the area-
you will see it in grey scale – then press ⬡enter ⬡enter ⬡esc

You should now see the area of the rectangle labeled with square units.

NOTE: There may be some round off error. Discuss this with your teacher if needed.

How would you solve for the width if you only knew the length and the area?

Write your answer here: _____

_____

Now go to page 2.1 of your document.  Use the ⬡tab to move from the question to the answer area of the screen. Type your answer above in the answer area of page 2.1.

Write the formula that you now generated by solving the formula for the area of a rectangle for the width.

## W =

Now go to page 2.2. Substitute the given values into your
formula above. Solve for the width of the rectangle. Check
your answer again with the measurement tool.

Using the measurement tool: This time you will need to select the length:

⬡menu ⟨7⟩ ⟨1⟩
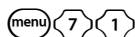
When you move over the rectangle you will see the rectangle flashing, the word rectangle, and the hand
with the finger pointing. Move the hand until it is on one of the sides that is the width. When you see TAB
press ⬡tab and you will see side length. Again press ⬡enter ⬡enter ⬡esc.

Did you once again show all your work? Let a partner or your teacher check it.

Now for some review: Pages 2.2 – 2.8 are going to ask you to generate some examples of equations that
require specific operations to solve for the unknown. These may be equations with one variable. You
might want to jig saw these with other partner pairs or groups and then come back together to share your

examples and discuss them. When you are finished you should have one example and the work solving for the unknown for each page.

Page 2.2: EXAMPLE:                           WORK:

Page 2.3: EXAMPLE:                           WORK:

Page 2.4: EXAMPLE:                           WORK:

Page 2.5: EXAMPLE:                           WORK:

Page 2.6: EXAMPLE:                           WORK:

Page 2.7: EXAMPLE:                WORK:


Page 2.8: EXAMPLE:                WORK:


List any questions you may still have. Discuss these with your teacher before proceeding on to the last page.

**Solve each equation or formula for the variable specified.**

1. $8x - 5y = 7$, for x.

2. $A = \frac{1}{2} bh$, for b

3. $I = prt$, for t

4. $V = \pi r^2 h$, for h

5. $y = mx + b$, for m.

6. $\dfrac{by + 2}{3} = c$, for y.

7. $P = \dfrac{E^2}{R}$, for R.

8. $V = 4/3 \, \pi r^3$, for r

9. $BTU = \dfrac{WHILE}{60}$, for L

10. $M = \dfrac{LB}{2T^2}$, for T

## Activity extensions

Look through your science book and list three formulas that have not been used in this activity and tell what each one is used for and define each of the variables.