



Algebra With Excel

Algebra skills are used in business everyday. In fact, we probably use the skills that are taught in Math classes much more often than we realize.

Expressions and Variables

An amount written using numbers and operation signs is called an **expression**. An example would be $a + b$.

A symbol that represents an unknown number is called a **variable**. For example, the variables in $8x^2y^3$ are x and y .

Equations and Formulas

An **equation** is a statement showing that two expressions are equal. The $=$ sign is used to show that equality.

Note that an expression in equation may consist of 1 more **terms**. For example, the equation $5 + 10 = 15$ consists of 2 **expressions** ($5+10$ and 15). The expression on the left consists of 2 terms (5 and 10).

When solving equations, we determine one of more unknown terms or variables. A **solution** to an equation is found when all variable are replaced with terms.

Formulas are equations that help us solve specific problems. They are an important part of Algebra and *real-world* problems solving.

Excel is an ideal tool to solve a variety of problems with formulas. So formulas are used so often, that they are built into Excel. These preset formulas are called **functions**.

Perimeter and Area of Rectangles

The **perimeter** of a rectangle (distance around all four sides) can be found with the formula of $P = 2L + 2W$ where: P = perimeter, L = length, and W = width.

The **area** of a rectangle as measured in square units is calculated with the formula $A=LW$ where: A = area, L = length, and W = width.

Example:

A rectangle measures 5' by 10'. Find the perimeter and the area.

SOLUTION:

Perimeter: $P = 2L + 2W$

$$P = 2(5') + 2(10')$$

$$P = 10' + 20'$$

$$P = 30'$$

$L = 10$ feet



$W = 5$ feet

Area: $A = LW$

$$A = 10 \times 5$$

$$A = 50 \text{ square feet or ft}^2$$

This problem is easily solved with a calculator. To calculate the perimeter and area of a larger number of rectangles, however, would be an ideal problem for Excel.

1. Open Excel and start a new workbook.
2. Save this file as **RECTANGLES**.
3. In cell A1, enter: **Perimeter and Area of Rectangles**.
4. In cell A2, enter: **Your Name**.
5. In cell A3, enter **Units = Feet**.
6. Leave cell A4 blank.
7. In cell A5 enter: **Length**.
8. In cell B5, enter **Width**.
9. In cell C5, enter **Perimeter**.
10. In cell D5, enter **Area (sq ft)**.

Enter the following data (**Do not enter the text FORMULA or FILL DOWN**):

	A	B	C	D
1	Perimeter and Area of Rectangles			
2	YOUR NAME			
3	Units = Feet			
4				
5	Length	Width	Perimeter	Area (sq ft)
6	12		7 FORMULA	FORMULA
7	25		10 FILL DOWN	FILL DOWN
8	70		20 FILL DOWN	FILL DOWN
9	15		5 FILL DOWN	FILL DOWN
10	125		50 FILL DOWN	FILL DOWN
11	7		3 FILL DOWN	FILL DOWN
12	95		12 FILL DOWN	FILL DOWN
13	255		150 FILL DOWN	FILL DOWN
14	75		22 FILL DOWN	FILL DOWN
15	475		360 FILL DOWN	FILL DOWN
16	19		16 FILL DOWN	FILL DOWN
17	42		12 FILL DOWN	FILL DOWN
18	87		56 FILL DOWN	FILL DOWN
19	31		5 FILL DOWN	FILL DOWN
20	60		18 FILL DOWN	FILL DOWN

- In cell C6, enter the formula $=2*A6 + 2*B6$
- In cell D6, enter the formula $=A6*B6$
- Excel has a **FILL** feature that will automatically copy a formula and re-write it so that it will correctly calculate a formula as it is filled down or across the spreadsheets. The cell addresses in these 2 formulas are called **RELATIVE CELL ADDRESSES**. The fill command will fill these formulas and adjust these cell addresses to be correct relative to the row or column that are filled to. We will use this feature to quickly and accurately perform ALL calculations by carefully following steps 15-18.
- Using the mouse, highlight the range C6:C20.
- Pull down the **EDIT** menu, select **FILL**, and choose **DOWN**.
- Using the mouse, highlight the range D6:D20.
- Pull down the **EDIT** menu, select **FILL**, and choose **DOWN**.
- Spell check and proofread your work.
- Save your file (you should have already named it **RECTANGLES**).

FORMATTING AND PRINTING

- Using the mouse, highlight the range A1:D5.
- Locate the **BOLD** button on the **FORMATTING** tool bar. Click it to apply **BOLD**.
- Using the mouse, highlight the range A6:D20.
- Pull down the **FORMAT** menu, select **CELLS**, and click on the **BORDERS** button.
- You should see screen at right:
- Under the **LINE** section, select the 5th line style in the second column as illustrated above.
- Under the **BORDER** section, click on the top and bottom of the text area as illustrated above. Click **OK**.
- SAVE** your file and **PRINT** your work.

