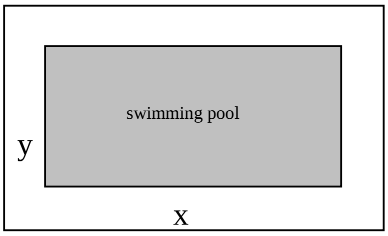
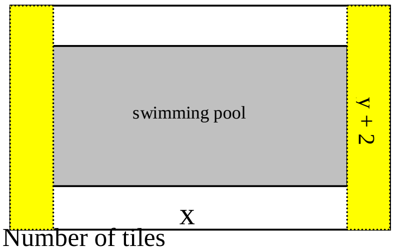
Tips

Say it with Symbols

Determining the number of 1 ft x 1 ft border tiles necessary for a pool with *x* ft long and *y* ft wide.



Method 1:

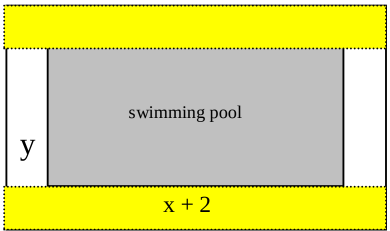


N = Number of tiles

$N = 2(y + 2) + 2x$

(There are 2 of the yellow rectangles measuring y + 2 and 2 of the x rectangles)

Method 2:



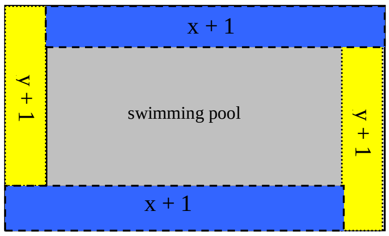
$N = 2(x + 2) + 2y$

(There are 2 of the yellow rectangles measuring x + 2 and 2 of the y rectangles.)

* You may also choose to simplify by distributing:

$N = 2(x + 2) + 2y = 2x + 4 + 2y$

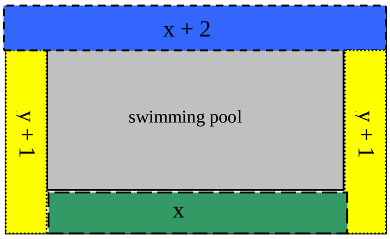
Method 3:



$N = 2(x + 1) + 2(y + 1)$

(There are two rectangles measuring x + 1 and 2 rectangles measuring y + 1)

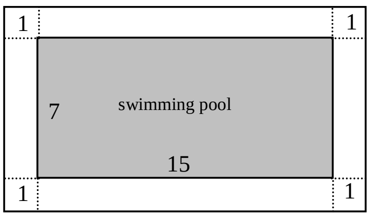
Method 4:



$N = 2(y + 1) + x + (x + 2)$

* Note: The possibilities are limitless. You can be creative as you wish. You could cut the corner pieces in half.

How many 1-ft-square border tiles do you need to surround a pool that is 15 ft long and 7 ft wide?



$N = 2(15) + 2(7) + 4 = 48$ tiles

The Rothschild pool is trying to set their summer budget. In order to do so, they must make some predictions for the summer. They calculate profit *P* based on the number of visitors *V* to come to the pool. The pool workers also know that the number of visitors is based on the probability of rain occurring *R*. Use the following equations to answer each question.

$P = 4.5V - 500 \quad V = 300 - 280R$

Suppose the probability of rain is 40%. What profit can the pool expect to make?

Method 1:

$V = 300 - 280(.4)$
$= 300 - 112$
$= 188$

$P = 4.5(188) - 500$
$= 846 - 500$
$= 346$

The pool can expect to make a profit of $346.

Method 2:

$P = 4.5(300 - 280R) - 500$ Substitute the value of V.
$= 1350 - 1260R - 500$ Distribute.
$= 850 - 1260R$ Two formulas combined into one

$P = 850 - 1260(.4)$ Substitute value of R.
$= 850 - 504$
$= \$346$

If the park were expecting to make $200, what would the probability of rain be?

Method 1:

$$\begin{aligned} 200 &= 4.5V - \cancel{500} \\ +500 \quad & \quad + \cancel{500} \\ \underline{700} &= \underline{4.5V} \\ 4.5 \quad & \quad 4.5 \\ V &\approx 156 \end{aligned}$$

$$\begin{aligned} 156 &= \cancel{300} - 280R \\ -300 \quad & -\cancel{300} \\ \underline{-144} &= \underline{-280R} \\ -280 \quad & \quad -280 \\ R &\approx 51\% \end{aligned}$$

Check: $V = 300 - 280(.51)$
$= 300 - 142.8$
$= 157.2$

$P = 4.5(157.2) - 500$
$= 707.4 - 500$
$= \$207.4$

Method 2:

$P = 850 - 1260R$ (Found above.)

$$\begin{aligned} 200 &= \cancel{850} - 1260R \\ \underline{-850} \quad & \underline{-\cancel{850}} \\ \underline{-650} &= \underline{-1260R} \\ -1260 \quad & \quad -1260 \\ 52 &\approx R \end{aligned}$$

Check: $P = 850 - 1260(.52)$
$= 850 - 655.2$
$= \$194.80$

Solve.

Ex 1) $5(x - 3) = -50$ Distribute.
$5x + -\cancel{15} = -50$ Move the constant.
$+ \cancel{15} \quad + 15$
$\underline{5x} = \underline{-35}$
$5 \quad\quad 5$
$x = -7$

Check: $5(-7 - 3) = -50$
$5(-10) = -50$
$-50 = -50$

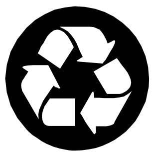
Ex 2) $\cancel{6x} - 7 = 8x + 5$ Move variables to one side
$-\cancel{6x} \quad\quad -6x$
$-7 = 2x + \cancel{5}$
$+ -5 \quad\quad + -\cancel{5}$
$\underline{-12} = \underline{2x}$
$2 \quad\quad 2$
$-6 = x$

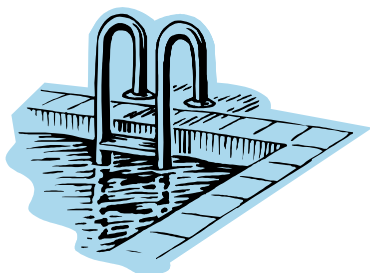
Check: $6(-6) - 7 = 8(-6) + 5$
$-36 + -7 = -48 + 5$
$-43 = -43$

Shortest method to find x.

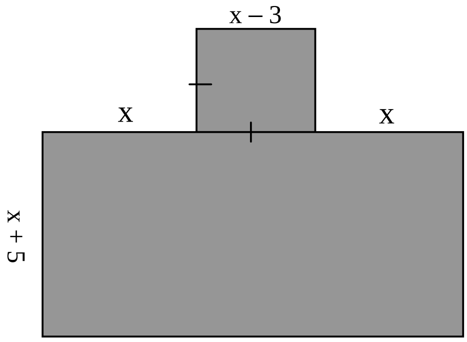
1) Distribute.
2) Combine Like Terms.
3) Move variables to one side.
4) Solve. (Move constant away from the variable. Then mult/div {whichever is the inverse} by the coefficient)

Coefficient is the number in front of the variable. Ex) 9x 9 is the coefficient.





Finding the area of the shaded region.



Example of an equation for the area of the pool to the left.

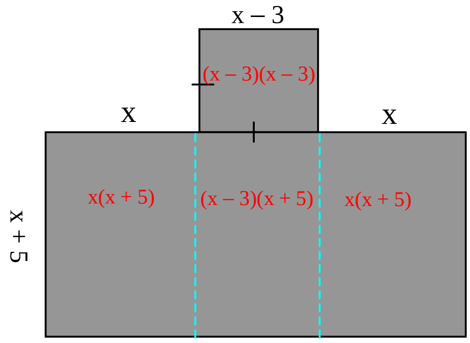
$A = (x + 5)(3x - 3) + (x - 3)(x - 3)$ Finding the area of the big rectangle and adding the area of the little rectangle.

– or –

$= 3x^2 + (-3x) + 15x + (-15) + x^2 + (-6x) + 9$ (using FOIL)

– or –

$= 4x^2 + 6x - 6$ (combining like terms)



$A = (x - 3)(x - 3) + x(x + 5) + (x - 3)(x + 5) + x(x + 5)$

– or –

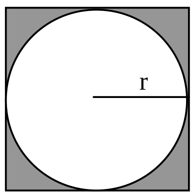
$= x^2 + (-6x) + 9 + x^2 + 5x + x^2 + 5x + (-3x) + (-15) + x^2 + 5x$

(using FOIL & distributing)

– or –

$= 4x^2 + 6x - 6$ (combining like terms)

Example 2. Find the area of the shaded region. (Assume the circle touches the square.)



$A_{shaded} = A_{square} - A_{Ccircle}$

$= r^2 - \pi r^2$

Order of Operations

1) Parentheses and grouping symbols.
2) Exponents.
3) Multiplication/Division from left to right.
4) Addition/Subtraction from left to right.

$2x + 7 - 3(x - 2) - 8 \bullet 4$

$2x + 7 - 3x + 6 - 32$

$-x - 19$

Please Excuse My Dear Aunt Sally or PEMDAS

The chorus students are selling boxes of chocolate as a fundraiser. The equation for the profit in dollars *P* in terms of the number of boxes sold *b* is:

$P = 5s - (125 + 2s)$

1) State the part that reflects the income:
   5s (really is 3s when like terms are combined)

2) State the part that reflects the expenses: ***125 + 2s***
   (really is 125 when like terms are combined)

3) What will the profit be if 250 boxes are sold?
   $5(250) - (125 + 2 \bullet 250)$
   $1250 - 625$
   $\$625$

4) Make the problem simpler.
   $5s - (125 + 2s) = 5s - 125 - 2s$
   $3s - 125$

5) How many boxes must be sold to break even?
   $0 = 3s - 125$
   $125 = 3s$
   $41\frac{2}{3} \approx 42$ ***boxes***

6) How many boxes must be sold to make a profit of $175?

$175 = 3s - 125$

$+ 125 \qquad + 125$

$\frac{300}{3} = \frac{3s}{3}$

100 boxes = x

Sam wants to rent a vehicle for the week.

Rent-A-Wreck charges a $50 fee plus $0.25 per mile after the first 200 miles: $C = 50 + 0.25(m - 200)$

All Car charges a $200 fee plus $0.05 per mile after the first 500 miles.
$C = 200 + 0.05(m - 500)$

When will the cost be the same?

$50 + 0.25(m - 200) = 200 + 0.05(m - 500)$

$50 + 0.25m - 50 = 200 + 0.05m - 25$

$0.25m = 175 + \cancel{0.05m}$

$-0.05m \qquad -\cancel{0.05m}$

$\frac{0.20m}{0.20} = \frac{175}{0.20}$

m = 875 miles

When is All Car cheaper?
$m > 875$ miles