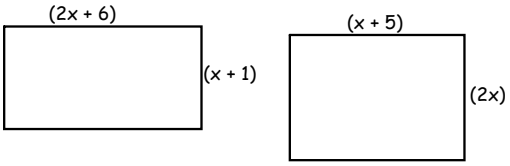
Example 1:

Two rectangles are equivalent.

Solve for x to find the numerical area.



(meaning their areas are the same)

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Example 1:

$(2x + 6)(x + 1) = (x + 5)(2x)$

$2x^2 + 2x + 6x + 6 = 2x^2 + 10x$

$2x^2 + 8x + 6 = 2x^2 + 10x$

$-2x^2 \quad -8x \quad -2x^2 \quad -8x$

$6 = 2x$

$x = 3$

$2(3) + 6 = 12,\ 3 + 1 = 4$

$12 \times 4 = \underline{48\ u^2}$

$3 + 5 = 8,\ 3 + 3 = 6$

$8 \times 6 = \underline{48\ u^2}$

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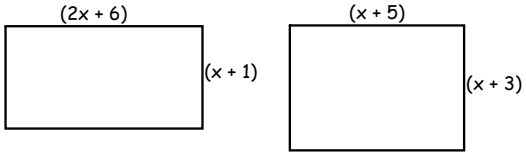
Example 2:

Two rectangles are equivalent.

Solve for x to find the numerical area.



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Example 2:

$(2x + 6)(x + 1) = (x + 5)(x + 3)$

$2x^2 + 2x + 6x + 6 = x^2 + 3x + 5x + 15$

$2x^2 + 8x + 6 = x^2 + 8x + 15$

$-x^2 \quad -8x \quad -6 \quad -x^2 \quad -8x \quad -6$

$\sqrt{x^2} = \sqrt{9}$

$x = 3$

$2(3) + 6 = 12,\ 3 + 1 = 4$

$12 \times 4 = \underline{48\ u^2}$

$3 + 5 = 8,\ 3 + 3 = 6$

$8 \times 6 = \underline{48\ u^2}$

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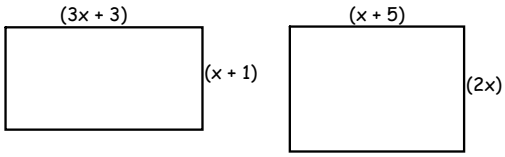
Example 3:

Two rectangles are equivalent.

Solve for x to find the numerical area.



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Example 3:

$(3x + 3)(x + 1) = (x + 5)(2x)$

$3x^2 + 3x + 3x + 3 = 2x^2 + 10x$

$3x^2 + 6x + 3 = 2x^2 + 10x$

$-2x^2$ $-10x$ $-2x^2$ $-10x$

$x^2 - 4x + 3 = 0$

What do we do now?

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Example 3 cont'd:

$x^2 - 4x + 3 = 0$

Guess and check? (That's for babies!)

Looking for two numbers that, when multiplied, give you +3 and when added give you -4.

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Example 3 cont'd:

$x^2 - 4x + 3 = 0$

Looking for two numbers that, when multiplied, give you +3 and when added give you -4.

Answer: - 3 & -1

we can rewrite our trinomial:

$x^2 - 3x - 1x + 3 = 0$

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Example 3 cont'd:

$x^2 - 4x + 3 = 0$

Answer: - 3 & -1

we can rewrite our trinomial:

$x^2 - 3x - 1x + 3 = 0$

now, we can group the trinomial and factor

GCF of $(x^2 - 3x)$ is x

GCF of -1x + 3 is -1 or +1

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Example 3 cont'd:

$x^2 - 4x + 3 = 0$

$x^2 - 3x - 1x + 3 = 0$

now, we can group the trinomial and factor

GCF of $(x^2 - 3x)$ is x

GCF of -1x + 3 is -1 or +1

so, x(x - 3) is the same as $x^2 - 3x$

and, -1(x - 3)/-1(x + 3) is the same as -x + 3

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Example 3 cont'd:

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so, x(x - 3) is the same as $x^2 - 3x$

and, -1(x - 3)/-1(x + 3) is the same as -x + 3

Notice the (x - 3) common to both?

That means we can rewrite our expression as

(x - 1)(x - 3) = 0

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Example 3 cont'd:

$x^2 - 4x + 3 = 0$

$x^2 - 3x - 1x + 3 = 0$

x (x - 3) - 1 (x - 3) = 0

That means we can rewrite our expression as

(x - 1)(x - 3) = 0

Now, what value(s) of x make the statement above true?

If x is 1 or 3, that statement is true.

Which means that there are two possible solutions to this particular question

If x = 1, both rectangles are 2 x 6 with an area of 12 u^2

If x = 3, rectangle 1 is 12 x 4 and rectangle 2 is 8 x 6, both with an area of 48 u^2

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