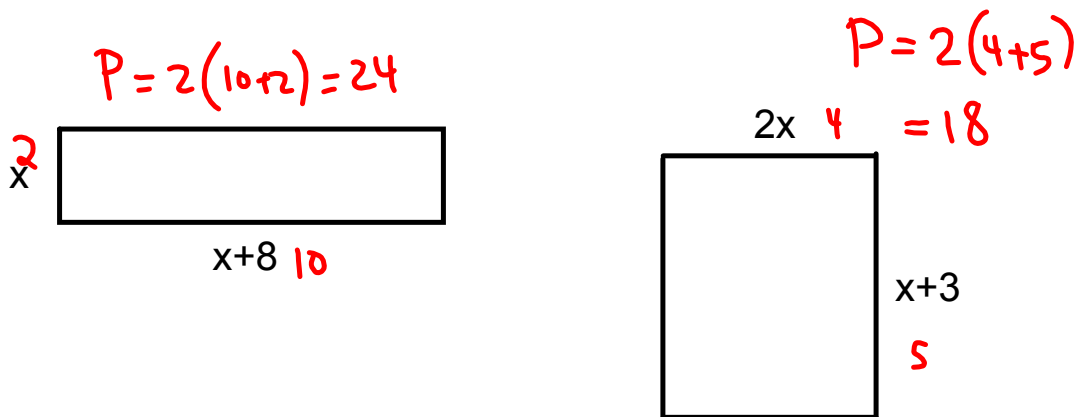


The following figures are equivalent. What is the perimeter of each?



$$x(x+8) = 2x(x+3)$$

$$x^2 + 8x = 2x^2 + 6x \quad \leftarrow \text{Quadratic equation}$$

$-6x \qquad -6x$

$$x^2 + 2x = 2x^2$$

$-x^2 \qquad -x^2$

special case  $\rightarrow \frac{2x}{x} = \frac{x^2}{x}$   $\leftarrow$  Guess + check

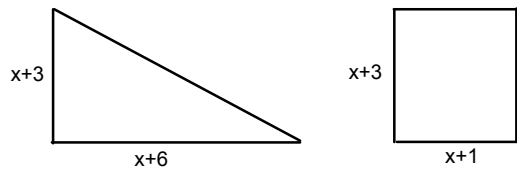
that doesn't

work all the time  $\quad 2 = x$

$x=1 \quad \times$

$x=2 \quad \checkmark$

The following figures are equivalent. What is the perimeter of each?



$$\frac{(x+3)(x+6)}{2} = \frac{(x+3)(x+1)}{1}$$

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

$$x^2 + 6x + 3x + 18 = 2(x^2 + 3x + x + 3)$$

$$x^2 + 9x + 18 = 2(x^2 + 4x + 3)$$

$$x^2 + 9x + 18 = 2x^2 + 8x + 6 \quad \leftarrow \text{Quadratic equation!}$$

$$x^2 + 9x + 12 = 2x^2 + 8x$$

$$x^2 + x + 12 = 2x^2$$

$$\frac{x+12}{x} = \frac{2x^2}{x} \rightarrow \frac{x+12}{x} = 2x$$

~~didn't work this time~~

$$12 = x^2 - x$$

Guess and check

- x=1 x
- x=2 x
- x=3 x
- x=4 ✓
- x=-3 ✓

$$12 = x(x-1)$$

(4)(3)  
x=4 ✓

Not great

$$x^2 - x - 12 = 0 \quad \leftarrow \text{!!!!!!}$$

$$(x-4)(x+3) = 0$$

$$x-4=0 \quad \text{or} \quad x+3=0$$

x=4                  x=-3