1. Factor each polynomial (completely). If it can't be factored, then label the polynomial as prime. Note that most of these are polynomials with some special pattern that allows you to factor them quickly. Check your factorization by multiplying out the factored version.

a) $x^2 - 25$

b) $1 - 49x^2$

c) $x^{10} - 9$

d) $16x^4 - 81$

e) $x^2 + 36$

f) $18y^2 - 2$

g) $x^2 + 2x + 1$

h) $x^2 - 14x + 49$

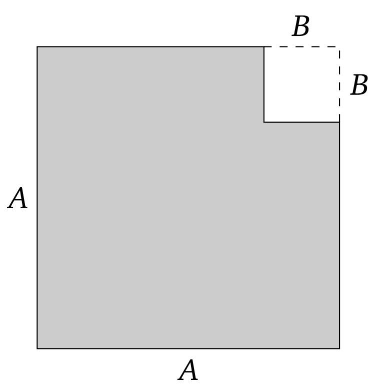
i) $x^2 + 22x + 121$

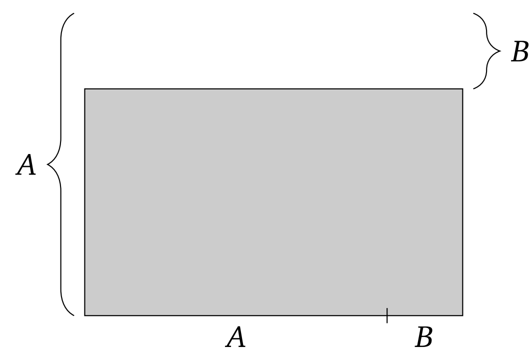
j) $x^2 + 10x + 100$

2. Find the prime factorization of the number 899 by observing that it equals $900 - 1$, and then observing that $900 = 30^2$.

3. Without using a calculator, find $\sqrt{10609}$ by observing that 10609 equals $10000 + 600 + 9$, and that $10000 = 100^2$.

4. The shaded area on the left represents $A^2 - B^2$. And the shaded area on the right represents $(A+B)(A-B)$. Recently we have learned that $A^2 - B^2 = (A+B)(A-B)$. Enhance these pictures to reveal an explanation for why this is true. You could draw some lines and shade some sections of the images in additional ways. Your goal is to draw a picture that convinces someone that the left shaded area equals the right shaded area.





5. The shaded area represents $(A+B)^2$. Recently we have learned that $A^2 + 2AB + B^2 = (A+B)^2$. Enhance the picture to reveal an explanation for why this is true. You could draw some lines and shade some sections of the images in additional ways. Your goal is to draw a picture that convinces someone that the shaded area is the same as $A^2 + 2AB + B^2$.