



# Factoring Stretch

1. \_\_\_\_\_ The prime factorization of 315 is  $3^2 \times 5 \times 7$ . What is the prime factorization of 3150?

2. \_\_\_\_\_ divisors How many distinct positive divisors does 180 have?

3. \_\_\_\_\_ divisors If  $x$ ,  $y$  and  $z$  are distinct primes, how many distinct positive divisors does  $x^3y^5z^2$  have?

4. \_\_\_\_\_ Tanya finds the least common multiple (LCM) of 180 and 3150. Vanya finds the greatest common divisor (GCD) of 180 and 3150. What is the positive difference between Tanya's number and Vanya's number?

5. \_\_\_\_\_ What is the sum of the GCD and the LCM of  $12^3$  and  $4^4$ ?



**FACTORING POLYNOMIALS:** In general, the second degree (**quadratic**) polynomial in standard form is  $ax^2 + bx + c$ . It factors into  $a(x - r_1)(x - r_2)$ , where  $r_1$  and  $r_2$  are the two roots.

6. \_\_\_\_\_ When  $x^2 - 8x - 209$  is written in factored form, what is the positive difference between the factors?

7. \_\_\_\_\_ If  $x - 4$  is a factor of  $x^2 + 13x - 12c + 4$ , what is  $c$ ?

8. \_\_\_\_\_ What is the sum of the solutions of  $2x^2 - 11x = -12$ ? Express your answer as a common fraction.

**THE QUADRATIC FORMULA:** When written in standard form  $ax^2 + bx + c$ , the two roots of a quadratic polynomial can be found using the **quadratic formula**.

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

9. \_\_\_\_\_ What are the solutions of the equation  $x^2 - x - 1 = 0$ ? Express your answer as a common fraction in simplest radical form.

10. \_\_\_\_\_ Robin's secret number is  $\frac{n-m}{p}$ , where  $\frac{m \pm \sqrt{n}}{p}$  are the solutions of the equation  $x^2 - 7x + 8 = 0$  and  $m$ ,  $n$  and  $p$  are relatively prime integers. What is Robin's secret number?