Algebra 1 — Problem Set 10 — Answers

1. Find the prime factorization of 750. $2 \cdot 3 \cdot 5^3$
2. Find the prime factorization of 2100. $2^2 \cdot 3 \cdot 5^2 \cdot 7$
3. List all factors of 96. 1, 2, 3, 4, 6, 8, 12, 16, 24, 32, 48, 96
4. Is the number 201 a prime? no, $3 \cdot 67 = 201$
5. The sides of a rectangle are 23 yards and 32 yards long.
   (a) Find the perimeter of the rectangle. $P = 110$ yd
   (b) Find the area of the rectangle. $A = 736$ yd^2
6. Consider the following numbers: 2008, 5410, 7956, 22 230, 1974
   (a) Find all the numbers from the list that are divisible by 4. 2008, 7956
   (b) Find all the numbers from the list that are divisible by 9. 7956, 22 230
   (c) Find all the numbers from the list that are divisible by 36. 7956
7. Perform the following division. Express your answer by giving the quotient and remainder. For example, $26 \div 6 = 4$ R 2.
   $78 \div 5 =$ 15 R 3
8. Simplify each of the following expressions.
   (a) $\dfrac{\left|\left|-2^2 - 20 \div (-2) \cdot 2\right| - 30\right|}{-2^3 - (-1)^3} =$ -2
   (b) $(-1)^1 + (-1)^2 + (-1)^3 + (-1)^4 + (-1)^5 =$ -1
   (c) $\dfrac{\left(-3^2 + 12 \div (-3) \cdot (-2)\right)^2 - 25 \div (-5)^2}{(-1)^2 + (-2)^3} =$ 0
9. Evaluate $\dfrac{3a^2 + a - 2}{a + 1}$ $(= 3a - 2)$ if
   (a) $a = -2$. -8
   (b) $a = -1$. undefined
   (c) $a = 3$. 7
10. Evaluate $\dfrac{2 - x}{x - 2}$ if
    (a) $x = -7$ -1
    (b) $x = 5$ -1
    (c) $x = 2$ undefined

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11. Solve each of the following equations. Make sure to check your solutions.

    (a) $5x - 3 = 12$ 3
    (b) $3x - 5 = x + 9$ 7
    (c) $3x - 8 = -x$ 2
    (d) $3x + 5 = 2x + 11$ 6

12. Consider the following numbers.

    $$-11, -10, -9, -8, -7, -6, -5, -4, -3, -2, -1,\ 0,\ 1,\ 2,\ 3,\ 4,\ 5,\ 6,\ 7,\ 8,\ 9,\ 10,\ 11,\ 12$$

    (a) Add all these numbers. 12
    (b) Multiply all theses numbers. 0

13. Graph the points $A\,(3, 5)$, $B\,(-2, -10)$, and $C\,(0, -4)$ in a rectangular coordinate system. Do these points form a straight line? Solution: yes