



## §1 Sunday, 07/05/20 Lesson Printable

### §1.1 Multiplying by 11 Problems

1.  $11 \times 54 =$  \_\_\_\_\_
2.  $11 \times 72 =$  \_\_\_\_\_
3.  $11 \times 38 =$  \_\_\_\_\_
4.  $462 \times 11 =$  \_\_\_\_\_
5.  $11 \times 74 =$  \_\_\_\_\_
6.  $66 \times 11 =$  \_\_\_\_\_
7.  $2003 \times 111 =$  \_\_\_\_\_
8.  $3 \times 5 \times 7 \times 11 =$  \_\_\_\_\_
9.  $121 \times 121 =$  \_\_\_\_\_
10.  $33 \times 1111 =$  \_\_\_\_\_
11.  $22 \times 32 =$  \_\_\_\_\_
12.  $44 \times 25 \times 11 =$  \_\_\_\_\_
13.  $55 \times 33 =$  \_\_\_\_\_
14. (\*)  $32 \times 64 \times 16 \div 48 =$  \_\_\_\_\_
15.  $2002 \div 11 =$  \_\_\_\_\_
16.  $77 \times 88 =$  \_\_\_\_\_

### §1.2 Quadratics Problems

1. Find the sum of roots to the equation  $x^{2020} = 2020x^{2019} + 1$ .
2. Find the product of the roots of the equation  $x^3 = 9\pi x + x^2 + 1$ .
3. (Mathcounts) What is the average value of the three roots of the equation  $x^3 - 12x^2 - 4x + 48 = 0$ ?
4. (Mathcounts State Sprint 2014/27) The fourth degree polynomial equation  $x^4 - 7x^3 + 4x^2 + 7x - 4 = 0$  has four real roots,  $a, b, c$  and  $d$ . What is the value of the sum  $\frac{1}{a} + \frac{1}{b} + \frac{1}{c} + \frac{1}{d}$ ? Express your answer as a common fraction.
5. Solve the following system of equations for  $x, y$ :

$$2x - 3y = 11,$$

$$xy = -5$$

6. Let  $p, q, r$  be roots of the polynomial  $x^3 - 2x^2 + 3x - 4$ . Find  $(p+1)(q+1)(r+1)$ .
7. (AMC 10A 2003/18) What is the sum of the reciprocals of the roots of the equation  $\frac{2003}{2004}x + 1 + \frac{1}{x} = 0$ ?
- (A)  $-\frac{2004}{2003}$       (B)  $-1$       (C)  $\frac{2003}{2004}$       (D)  $1$       (E)  $\frac{2004}{2003}$
8. The polynomial  $x^3 - ax + 15$  has three real roots. Two of these roots sum to 3. What is  $|a|$ ?
9. What is the only real number that could be a multiple root of  $x^3 + ax + 1 = 0$ , if  $a$  is real?