



Math Olympiad and Problem Solving Programs
E120 - Honors Algebra Problem Solving
Problem Set 1.1 - Number Sense Solutions

Name:

Date:

1. $\boxed{129}$
2. $\boxed{130}$
3. (a) $\boxed{-2}$
(b) $\boxed{84}$
(c) $\boxed{635}$
4. (a) $\boxed{\frac{41}{13}}$
(b) $\boxed{-\frac{16}{13}}$
5. (a) $\boxed{16}$
(b) $\boxed{3}$
(c) $\boxed{18}$
(d) $\boxed{12}$
(e) $\boxed{13}$
6. $\boxed{270}$
7. (a) $67 + 31 + 33 + 69 = (67 + 33) + (31 + 69) = \boxed{200}$
(b) $125 \times 4 \times 4 \times 24 = (125 \times 8) \times (2 \times 24) = \boxed{48,000}$
(c) $123 + 123 \times 999 = 123 \times (1 + 999) = \boxed{123,000}$
(d) $75 \times 22 + 34 \times 25 = 22 \times (75 + 25) + 12 \times 25 = \boxed{2,500}$
8. $15000 \div 125 \div 15 = (15000 \div 15) \div 125 = 1000 \div 125 = \boxed{8}$
9. There are 500 even numbers in the first parenthesis and 500 odd numbers in the second parenthesis. The difference between each corresponding even and odd number is one. For example, $2 - 1 = 1, 4 - 3 = 1, \dots, 1000 - 999 = 1$. Since we have 500 1's, the answer is $\boxed{500}$.
10. Let $x = 2008$, we have

$$(x - 1) \times (x + 1) - (x - 2) \times x = x^2 - 1 - (x^2 - 2x) = 2x - 1 = 2 \times 2008 - 1 = \boxed{4015}$$