



Math Olympiad and Problem Solving Programs
E130 - Honors Geometry Problem Solving
Problem Set 1.2 - Algebra Solutions

Name:

Date:

1. $\boxed{-16}$.

2. $a \div a^{-5} = a^6$ which means $\boxed{3^6 = 729}$.

3. $\boxed{1}$. $3x^3 - 4x^2 - 3x + 4 = (3x - 4)(x^2 - 1) = 0$. The solutions are $\{4/3, 1, -1\}$. Among them, only 1 is a positive integer.

4. Let student's age be x and professor's age be y , we have

$$x = \frac{y}{2} - 9$$

$$y = 3x$$

Solve the equations, we have $x = \boxed{18}$.

5. $\boxed{8\frac{5}{6}}$.

6. $\boxed{4}$.

7. $\boxed{1.4}$. Plug in $y = 148$, we have a quadratic equation: $148 = 128t - 16t^2$. The equation gives two solutions (1.4 s, 6.6 s). We take the smaller one as it is the time the ball first reach the height.

8. $\boxed{-\frac{5}{3}}$. Rewrite the equation, we have $y = -\frac{5}{3}x + 5$.

9. $\boxed{0}$.

10. $\boxed{-1}$.