Factor each expression completely.

1. $5x^3 - 180x$

2. $28x^2 - 84x + 63$

3. $8x^2 - 18y^2$

4. $4x^2y - 8xy + 4y$

Solve each equation.

5. $4x^2 + 4x + 1 = 0$

6. $9x^2 - 18x + 9 = 0$

7. $16x^3 + 8x^2 + x = 0$

8. $32x^3 - 16x^2 + 2x = 0$

9. $x^2 - 144 = 0$

10. $32x^4 - 8x^2 = 0$

Solve each problem.

11. The height of a diver during a dive can be modeled by $h = -16t^2$, where h is height in feet relative to the diving platform and t is time in seconds. Find the time it takes for the diver to reach the water if the platform is 49 feet above the water.

12. The height of a baseball at time t can be modeled by $h = -16t^2 + vt + s$. Where v is the initial upward velocity of the ball and s is the height at which the ball is hit. If a ball is 4 feet off the ground when it is hit with a negligible upward velocity close to 0 feet per second, when will the ball hit the ground?