6. (8 points) Solve the following equations *by factoring*.

(a) $x^2 - 5x - 6 = 0$

(b) $x^3 + 3x^2 - 4x - 12 = 0$

(c) $(2x - 1)^2 - 9 = 0$

(d) $6x^4 + 5x^3 - 4x^2 = 0$

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5. **[4]** Factor completely.

(a) $4x^4 + 8x^2 - 12$

(b) $24x^2 + 3x^5$

6. **[6]** Solve *by factoring*.

(a) $3x^2 + 5x = 2$

(b) $16x^3 - x = 0$

(c) $2x^3 + x^2 - 18x - 9 = 0$

11. **[3]** Rationalize the denominator and simplify.

(a) $\dfrac{\sqrt{2}}{3\sqrt{6}}$

(b) $\dfrac{\sqrt{3}}{2\sqrt{3} - \sqrt{5}}$

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11. **[3]** Rationalize the denominator and simplify.

(a) $\dfrac{\sqrt{2}}{\sqrt{10}}$

(b) $\dfrac{\sqrt{3} + 2\sqrt{2}}{3\sqrt{2} - 2\sqrt{3}}$

12. **[3]** *Using the Quadratic Formula*, find the solution(s) to $2(x^2 + 3x) = x^2 - 6$.

13. **[3]** *By completing the square*, find the solution(s) to $x^2 - 24 = 10x$.

14. **[3]** *By taking square roots*, find the solution(s) to $16\left(x - \dfrac{3}{4}\right)^2 - 25 = 0$.

12. **[3]** *Using the Quadratic Formula*, find the solution(s) to $4x^2 + 3x = 1$.

13. **[3]** *By completing the square*, find the solution(s) to $x^2 + 6x - 31 = 0$.

14. **[3]** *By taking square roots*, find the solution(s) to $4(2x + 4)^2 = 32$.

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7. Factorize each expression completely.

a. $x^4 - 13x^2 + 36$ b. $16s^4 - 2st^3$

8. Solve each equation for x by factorizing.

a. $4x^2 - 28x = 120$ b. $15x^2 - 4x = 3x + 4$ c. $2x^3 - 9x^2 = 8x - 36$

9. Rationalize the denominator and simplify the result. Be sure to leave no square under a square root sign.

a. $\dfrac{15}{\sqrt{5}}$

b. $\dfrac{4\sqrt{2}}{\sqrt{6} + 3\sqrt{2}}$

10. Solve the equation $\sqrt{4 - 12x} - 6 = 2x$ for x.

11. Solve the equation $x^2 - 6 = 3x$ for x *by completing the square*.

12. Solve the equation $3x^2 + 4x + 5 = 0$ for x *by using the Quadratic Formula*.

13. Solve the equation $\frac{1}{4}(x - 7)^2 - 30 = -5$ for x *by taking square roots*.