## 7.6 Start Thinking

| Standard Form | Factored Form |
|---|---|
| $2x^2 - 7x + 3$ | $(2x - 1)(x - 3)$ |
| $6x^2 - 13x + 6$ | $(3x - 2)(2x - 3)$ |
| $3x^2 + 7x - 6$ | $(3x - 2)(x + 3)$ |
| $3x^2 + x - 2$ | $(3x - 2)(x + 1)$ |

Make a list of factors of the coefficient of the $x^2$-term in the first polynomial in the standard form column. Make a list of the factors of the constant term separately. Use the FOIL method to transform the factored form of the polynomial, showing each step. Repeat these steps for each polynomial. Explain how to use the list of factors you made to write the polynomial in factored form.

## 7.6 Warm Up

**Factor the polynomial using the GCF.**

**1.** $5x^2 - 5x - 5$

**2.** $-x^3 + 12x^2 - 4x$

**3.** $4z^2 - 96z - 8$

**4.** $81y^2 + 36y - 3$

**5.** $7x^2y + 10xy + 11y$

**6.** $15t^2 - 45t + 90$

## 7.6 Cumulative Review Warm Up

**Write an equation in slope-intercept form of the line that passes through the given points.**

**1.** $(8, 1), (3, 11)$

**2.** $(7, -2), (4, -8)$

Name_____ Date _____

# 7.6 Practice A

**In Exercises 1–12, factor the polynomial.**

**1.** $6x^2 - 12x - 18$

**2.** $5x^2 - 15x - 50$

**3.** $9x^2 - 36x + 27$

**4.** $2x^2 + 2x - 4$

**5.** $6x^2 - 7x - 20$

**6.** $2x^2 - 5x - 3$

**7.** $4x^2 + 21x - 18$

**8.** $2x^2 - 13x - 45$

**9.** $3x^2 + 22x - 16$

**10.** $-2p^2 + 7p - 6$

**11.** $-5v^2 + 31v - 6$

**12.** $-6v^2 - 11v - 4$

**13.** Describe and correct the error in factoring the polynomial.

$$\times \quad -2t^2 + 13t - 15 = (2t + 3)(t + 5)$$

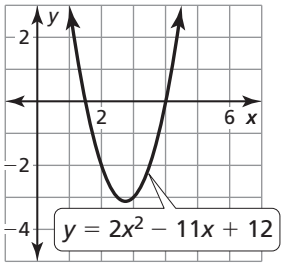
**In Exercises 14 and 15, solve the equation.**

**14.** $4x^2 - 4x - 24 = 0$

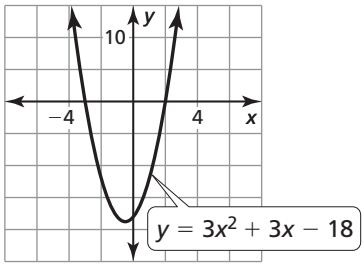
**15.** $3p^2 - 5p - 28 = 0$

**In Exercises 16 and 17, find the *x*-coordinates of the points where the graph crosses the *x*-axis.**

**16.**




**17.**




**18.** The height $h$ (in feet) above the water of a cliff diver is modeled by $h = -16t^2 + 10t + 26$, where $t$ is the time (in seconds). How long is the diver in the air?

**19.** For what values of $t$ can $10x^2 + tx + 8$ be written as the product of two binomials?

**In Exercises 20 and 21, factor the polynomial.**

**20.** $6a^2 - 13ab - 5b^2$

**21.** $4x^2 + 11xy - 3y^2$

Name _____ Date _____

# 7.6 Practice B

**In Exercises 1–12, factor the polynomial.**

**1.** $5x^2 - 5x - 30$

**2.** $8x^2 - 16x - 192$

**3.** $6x^2 + 48x + 42$

**4.** $2x^2 + 17x - 9$

**5.** $12p^2 - 7p - 10$

**6.** $10w^2 + 24w + 8$

**7.** $3y^2 + y - 14$

**8.** $12j^2 - 32j + 5$

**9.** $15d^2 + 16d - 15$

**10.** $-9v^2 - 22v - 8$

**11.** $-14m^2 + 13m - 3$

**12.** $-20q^2 + 56q - 15$

**13.** Describe and correct the error in factoring the polynomial.

$$6x^2 - 4x + 2 = (2x - 2)(3x + 1)$$

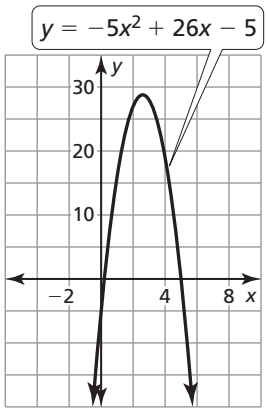
**In Exercises 14 and 15, solve the equation.**

**14.** $-12w^2 + 20w - 3 = 0$

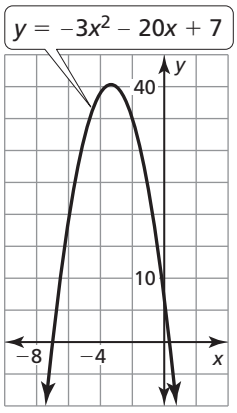
**15.** $18t^2 - 2 = 5t$

**In Exercises 16 and 17, find the *x*-coordinates of the points where the graph crosses the *x*-axis.**

**16.**




**17.**




**18.** The length of a rectangular patio is 8 feet less than twice its width. The area of the patio is 280 square feet. Find the dimensions of the patio.

**19.** For what values of $t$ can $6x^2 + tx + 25$ be written as the product of two binomials?

**In Exercises 20 and 21, factor the polynomial.**

**20.** $-10r^2 - 11sr + 6s^2$

**21.** $12x^3 + 8x^2y - 20xy^2$

Name_____ Date _____

# 7.6 Enrichment and Extension

## Factor $ax^2 + bx + c$ by Grouping

**Example:** Factor $5x^2 - 8x - 4$.

| | |
|---|---|
| $5x^2 - 8x - 4 = 5x^2 - 10x + 2x - 4$ | Rewrite the $x$-term as a sum of two terms whose coefficients have product $ac$ and sum $b$. |
| $= (5x^2 - 10x) + (2x - 4)$ | Group terms. |
| $= 5x(x - 2) + 2(x - 2)$ | Factor GCF out of each pair of terms. |
| $= (5x + 2)(x - 2)$ | Distributive Property |

**In Exercises 1–10, factor completely.**

**1.** $6x^2 + 11x + 3$

**2.** $4y^2 + 12y + 5$

**3.** $3p^2 + 4p - 7$

**4.** $4x^2 - 20x - 11$

**5.** $12x^2 - x - 1$

**6.** $40v^2 - 22v + 3$

**7.** $8u^2 + 34u + 15$

**8.** $-9d^2 - 9d + 4$

**9.** $45x^2 + 105x + 30$

**10.** $-2t^2 - t + 1$

**11.** Create your own trinomial by working backwards. Start with a product of two binomials.

Name _____ Date _____

# 7.6 Puzzle Time

## How Did The Sea Urchin Pay For His Meal?

Write the letter of each answer in the box containing the exercise number.

**Factor the polynomial.**

**1.** $2x^2 + 4x - 16$

**2.** $5x^2 + 21x + 18$

**3.** $4x^2 - 4x - 63$

**4.** $6x^2 - 19x + 8$

**5.** $-9x^2 + 31x + 20$

**6.** $3x^2 - 6x - 24$

**7.** $28x^2 + x - 15$

**8.** $-36x^2 + 30x + 66$

**9.** $-10x^2 - 34x - 12$

**10.** $6x^2 - 19x - 36$

**Solve the equation.**

**11.** $4x^2 + 40x + 84 = 0$

**12.** $-3x^2 - 15x + 72 = 0$

**13.** $-15x^2 + 28x - 5 = 0$

**14.** $24x^2 - 47x - 21 = 0$

**15.** The length of a rectangular platform is 2 feet longer than three times its width. The area of the platform is 56 square feet. What are the width and the length of the platform?

**Answers**

**N.** $(7x - 5)(4x + 3)$

**S.** $(3x + 4)(2x - 9)$

**A.** $(5x + 6)(x + 3)$

**W.** $-(9x + 5)(x - 4)$

**H.** $-2(5x + 2)(x + 3)$

**A.** $(3x - 8)(2x - 1)$

**L.** $2(x + 4)(x - 2)$

**D.** $-6(6x - 11)(x + 1)$

**R.** $3(x - 4)(x + 2)$

**T.** $(2x - 9)(2x + 7)$

**A.** $\frac{1}{5}, \frac{5}{3}$

**I.** $-7, -3$

**D.** $4, 14$

**L.** $-\frac{3}{8}, \frac{7}{3}$

**O.** $-8, 3$

| 5 | 11 | 3 | 9 | | 2 | | 10 | 13 | 7 | 15 | | 8 | 12 | 1 | 14 | 4 | 6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | |