CHAPTER 7 Quadratic Expressions

Get Set

Answer these questions to check your understanding of the Get Ready concepts on pages 278–279 of the *Foundations of Mathematics 10* textbook.

Polynomials

1. Circle the numerical coefficient in each term and identify each expression as a monomial, binomial, or trinomial.

   a) $3x$
   b) $4x^2 + 3x - 1$
   c) $8x^3$
   d) $x^2 + 7x$

Algebraic Expressions

2. Multiply or divide as indicated.

   a) $3(4y)$
   b) $(-2t)(-3t)$
   c) $-6x \div 3$
   d) $\dfrac{15x^2}{3x}$

3. Simplify.

   a) $5x + 4 - 7x - 1$
   b) $x^2 + 2x + 4 + x$
   c) $x^2 + 8x^2 - 7 - 5x + 13x$

4. Expand.

   a) $2(x - 5)$
   b) $5x(2x + 6)$
   c) $-3(4x^2 + 4x - 2)$
   d) $2x^2(3x + 5)$

Number Operations

5. Square each term.

   a) -6
   b) $4x$
   c) $10y$
   d) $-5x$

Measurement

6. Find the area of the shaded region in the diagram.

20 cm
4 cm
3 cm
15 cm
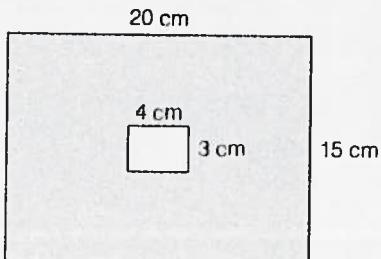
7.1 Multiply Two Binomials
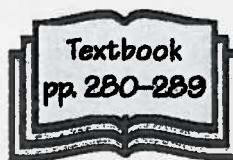
Warm-Up

1. Number Operations

Evaluate.

a) $3(2 + 6)$

b) $(12 - 6)(10 - 5) + 4$

2. Factors

Find the greatest whole number that divides evenly into each pair.

a) 8 and 16

b) 21 and 49

3. The Distributive Property

Expand.

a) $4x(3x + 2)$

b) $5x(2x + 6)$

4. Math Literacy

a) What does the prefix *bi* mean?

b) Give an example of a word with this prefix.

5. Estimation

A piece of string 8.2 m long is lengthened by a factor of 4.1. What is the approximate length of the new string?

6. Simplify Algebraic Expressions

Simplify.

a) $14x + 12 - 5x + 8$

b) $-(a + 5) + 4a + 7$

7.2 Common Factoring

Warm-Up
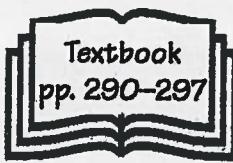
1. Number Operations

Evaluate.

a) $\dfrac{(3 \times 4)}{2} + \dfrac{(3 \times 9)}{3}$

b) $-(-2 \times 9) \div 3$

2. Factors

Provide three factors of

a) 30

b) 72

3. The Distributive Property

Expand.

a) $2a(6 - 2a + b)$

b) $-7(x - 4y + 6)$

4. Math Literacy

What is the opposite process to factoring?
Explain why.

5. Estimate

A case of printer paper containing
5 packages of 500 sheets costs $24.89.

a) Roughly how much does each
package of paper cost?

b) Roughly how much does each sheet
of paper cost?

6. Simplify Algebraic Expressions

Simplify.

a) $-4x + 4 - 12x - 6$

b) $x^2 + 2x + 4 + x + 4x^2$

Practise

1. Find the greatest common factor (GCF) of
   a) 64 and 72   b) $2a^2$ and $12a$ c) $4x^2$ and $6x$

2. For each polynomial, indicate if it is in the *factored* form or *expanded* form and identify the greatest common factor.
   a) $3x - 12$ b) $5(13y - x^2)$ c) $3x^2 - 12x + 9$

   GCF =   GCF =   GCF =

3. Completely factor each polynomial and check by expanding
   a) $3p - 15$ b) $21x^2 - 9x + 18$ c) $6y^2 + 18y + 30$

   $= 3(\underline{\quad} - \underline{\quad})$ =   =

   Check: Check: Check:

4. Write a trinomial expression with a GCF of $3n$. Factor the expression.

5. The expression $A = 5x^2 + 15x$ represents the area of a playground in a park, with area in square metres (m^2).
   a) Factor the expression completely.

   $A = \underline{\quad}(\underline{\quad} + \underline{\quad})$

   b) Based on your answer for part a), provide expressions for the dimensions and draw a sketch of the playground.

   c) What is the area of the playground if $x = 9$ m?

   d) The city has decided to completely fence in the playground and needs to determine its perimeter. Using the dimensions from part b), write the formulas for the perimeter and area of the playground.

   Perimeter = 2 _____ + 2 _____

   Area = _____

   e) Using the area you calculated in c), determine how many metres of fencing will be needed to completely fence in the playground.

6. Use a CAS to find the GCF for the following trinomials.
   a) $6a^2 + 12a + 18$

   GCF = _____

   b) $18a^2 + 27a + 81$

   GCF = _____