**Chapter 3 McReview**

**Multiple Choice**

*Identify the choice that best completes the statement or answers the question.*

**\_\_\_\_ 1.** Factor: 

|  |  |  |  |
| --- | --- | --- | --- |
| **A.** |  | **C.** |  |
| **B.** |  | **D.** |  |

**\_\_\_\_ 2.** Factor this polynomial: 

|  |  |  |  |
| --- | --- | --- | --- |
| **A.** | ()() | **C.** | ()() |
| **B.** | ()() | **D.** | ()() |

**\_\_\_\_ 3.** Factor this polynomial: 

|  |  |  |  |
| --- | --- | --- | --- |
| **A.** | ()() | **C.** | ()() |
| **B.** | ()() | **D.** | ()() |

**\_\_\_\_ 4.** Factor this polynomial: 

|  |  |  |  |
| --- | --- | --- | --- |
| **A.** |  | **C.** |  |
| **B.** |  | **D.** |  |

**\_\_\_\_ 5.** Factor this polynomial: 

|  |  |  |  |
| --- | --- | --- | --- |
| **A.** |  | **C.** |  |
| **B.** |  | **D.** |  |

**\_\_\_\_ 6.** Factor this polynomial expression: 

|  |  |  |  |
| --- | --- | --- | --- |
| **A.** |  | **C.** |  |
| **B.** |  | **D.** |  |

**\_\_\_\_ 7.** Factor this polynomial expression: 

|  |  |  |  |
| --- | --- | --- | --- |
| **A.** |  | **C.** |  |
| **B.** |  | **D.** |  |

**\_\_\_\_ 8.** Factor this polynomial expression: 

|  |  |  |  |
| --- | --- | --- | --- |
| **A.** |  | **C.** |  |
| **B.** |  | **D.** |  |

**\_\_\_\_ 9.** Factor: 

|  |  |  |  |
| --- | --- | --- | --- |
| **A.** |  | **C.** |  |
| **B.** |  | **D.** |  |

**\_\_\_\_ 10.** Solve this equation: 

|  |  |  |  |
| --- | --- | --- | --- |
| **A.** |  or  | **C.** |  or  |
| **B.** |  or  | **D.** |  or  |

**\_\_\_\_ 11.** Solve by factoring: 

|  |  |  |  |
| --- | --- | --- | --- |
| **A.** |  or  | **C.** |  |
| **B.** |  | **D.** |  or  |

**\_\_\_\_ 12.** Solve by factoring: 

|  |  |  |  |
| --- | --- | --- | --- |
| **A.** |  | **C.** |  |
| **B.** |  | **D.** |  |

**\_\_\_\_ 13.** Solve by factoring: 

|  |  |  |  |
| --- | --- | --- | --- |
| **A.** | *x* = –4 or *x* =  | **C.** | *x* = 4 or *x* =  |
| **B.** | *x* = 4 or *x* =  | **D.** | *x* = –4 or *x* =  |

**\_\_\_\_ 14.** Solve by factoring: 

|  |  |  |  |
| --- | --- | --- | --- |
| **A.** |  | **C.** |  |
| **B.** |  | **D.** |  |

**\_\_\_\_ 15.** Determine the value of  that makes  a perfect square.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **A.** | 25 | **B.** | 10 | **C.** | 100 | **D.** | 625 |

**\_\_\_\_ 16.** Solve  by completing the square.

|  |  |  |  |
| --- | --- | --- | --- |
| **A.** |  | **C.** |  |
| **B.** |  | **D.** |  |

**\_\_\_\_ 17.** Solve ** by completing the square.

|  |  |  |  |
| --- | --- | --- | --- |
| **A.** |  | **C.** |  |
| **B.** |   | **D.** |   |

**\_\_\_\_ 18.** Solve  by completing the square.

|  |  |  |  |
| --- | --- | --- | --- |
| **A.** | *x* =  or *x* =  | **C.** | *x* =  or *x* =  |
| **B.** | *x* =  or *x* =  | **D.** | *x* =  or *x* =  |

**\_\_\_\_ 19.** What is the coefficient of *x* in the quadratic equation ?

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **A.** | –1 | **B.** | –6 | **C.** | 6 | **D.** | 8 |

**\_\_\_\_ 20.** Solve this quadratic equation: 

|  |  |  |  |
| --- | --- | --- | --- |
| **A.** |  | **C.** |   |
| **B.** |  | **D.** |   |

**Short Answer**

 **1.** Is  a factor of the trinomial ?

 **2.** Is  a factor of the trinomial ?

 **3.** Factor this trinomial: 

 **4.** Factor this polynomial expression: 

 **5.** Factor this polynomial expression: **

 **6.** The total area of the large rectangle below is 24 m2. Determine the value of *x*.



 **7.** Solve this equation: 

 **8.** Solve this equation: 

 **9.** Solve this equation: 

 **10.** Solve this equation: 

 **11.** When 7 times a number is added to the square of the number, the sum is 3.

What is the number?

 **12.** The area of a trapezoid with bases *a* and *b* and height *h* metres is given by the formula . A landscaper is designing a flower garden in the shape of a trapezoid, as shown below. Determine the length *x* metres that will result in the garden having area 130 m2. Give the answer to the nearest tenth of a metre.



 **13.** Simplify this radical expression: 

 **14.** A car was travelling at a constant speed of 15 m/s, then accelerated for 10 s. The distance travelled during this time, *d* metres, is given by the formula , where *t* is the time in seconds since the acceleration began. How long did it take the car to travel 500 m? Give the answer to the nearest tenth of a second.

 **15.** a) Calculate the value of the discriminant for the equation .

b) How many roots does the equation have?

 **16.** a) Calculate the value of the discriminant for the equation .

b) How many roots does the equation have?

 **17.** a) Calculate the value of the discriminant for the equation  = 0.

b) Are the roots rational or irrational?

 **18.** A model rocket is launched. Its height, *h* metres, after *t* seconds is described by the formula . Without solving the equation, determine whether the rocket reaches a height of 30 m.

 **19.** a) Determine the value of the discriminant for this equation: 

b) Use the value of the discriminant to choose a solution strategy, then solve the equation.

 **20.** a) Determine the value of the discriminant for this equation: 

b) Use the value of the discriminant to choose a solution strategy, then solve the equation.

**Problem**

 **1.** Factor this polynomial expression: . Show your work.

 **2.** Factor this polynomial expression: . Explain your strategy.

 **3.** Solve this equation, then verify the solution: 

Explain your steps.

 **4.** A student wrote the solution below to solve this equation: 



Identify the error, then write the correct solution.

 **5.** Solve  by completing the square. Show your work.

**6.** A student wrote the solution below to solve this quadratic equation: 



The roots are:  and 

Identify the error, then write the correct solution.

 **7.** a) Is this equation quadratic: ? Justify your response.

b) Describe a strategy you could use to solve the equation in part a.

c) Solve the equation in part a. Show your work.

 **8.** Determine the values of *k* for which the equation  has two real roots, then write a possible equation.

 **9.** Determine the values of *k* for which the equation  has no real roots, then write a possible equation.

 **10.** Consider the equation . Determine two values of *k* for which this equation has two rational roots. Show your work.

**Chapter 3 McReview**

**Answer Section**

**MULTIPLE CHOICE**

 **1.** ANS: D PTS: 0 DIF: Easy

REF: 3.1 Factoring Polynomial Expressions LOC: 11.RF1

TOP: Relations and Functions KEY: Procedural Knowledge

 **2.** ANS: C PTS: 0 DIF: Easy

REF: 3.1 Factoring Polynomial Expressions LOC: 11.RF1

TOP: Relations and Functions KEY: Procedural Knowledge

 **3.** ANS: B PTS: 0 DIF: Easy

REF: 3.1 Factoring Polynomial Expressions LOC: 11.RF1

TOP: Relations and Functions KEY: Procedural Knowledge

 **4.** ANS: B PTS: 0 DIF: Moderate

REF: 3.1 Factoring Polynomial Expressions LOC: 11.RF1

TOP: Relations and Functions KEY: Procedural Knowledge

 **5.** ANS: D PTS: 0 DIF: Moderate

REF: 3.1 Factoring Polynomial Expressions LOC: 11.RF1

TOP: Relations and Functions KEY: Procedural Knowledge

 **6.** ANS: D PTS: 0 DIF: Moderate

REF: 3.1 Factoring Polynomial Expressions LOC: 11.RF1

TOP: Relations and Functions KEY: Procedural Knowledge

 **7.** ANS: A PTS: 0 DIF: Moderate

REF: 3.1 Factoring Polynomial Expressions LOC: 11.RF1

TOP: Relations and Functions KEY: Procedural Knowledge

 **8.** ANS: C PTS: 0 DIF: Moderate

REF: 3.1 Factoring Polynomial Expressions LOC: 11.RF1

TOP: Relations and Functions KEY: Procedural Knowledge

 **9.** ANS: D PTS: 0 DIF: Moderate

REF: 3.1 Factoring Polynomial Expressions LOC: 11.RF1

TOP: Relations and Functions KEY: Procedural Knowledge

 **10.** ANS: D PTS: 0 DIF: Easy

REF: 3.2 Solving Quadratic Equations by Factoring LOC: 11.RF5

TOP: Relations and Functions KEY: Procedural Knowledge

 **11.** ANS: A PTS: 0 DIF: Easy

REF: 3.2 Solving Quadratic Equations by Factoring LOC: 11.RF5

TOP: Relations and Functions KEY: Procedural Knowledge

 **12.** ANS: A PTS: 0 DIF: Easy

REF: 3.2 Solving Quadratic Equations by Factoring LOC: 11.RF5

TOP: Relations and Functions KEY: Procedural Knowledge

 **13.** ANS: A PTS: 0 DIF: Moderate

REF: 3.2 Solving Quadratic Equations by Factoring LOC: 11.RF5

TOP: Relations and Functions KEY: Procedural Knowledge

 **14.** ANS: B PTS: 0 DIF: Moderate

REF: 3.2 Solving Quadratic Equations by Factoring LOC: 11.RF5

TOP: Relations and Functions KEY: Procedural Knowledge

 **15.** ANS: A PTS: 0 DIF: Easy

REF: 3.3 Using Square Roots to Solve Quadratic Equations LOC: 11.RF5

TOP: Relations and Functions KEY: Procedural Knowledge

 **16.** ANS: B PTS: 0 DIF: Moderate

REF: 3.3 Using Square Roots to Solve Quadratic Equations LOC: 11.RF5

TOP: Relations and Functions KEY: Procedural Knowledge

 **17.** ANS: A PTS: 0 DIF: Moderate

REF: 3.3 Using Square Roots to Solve Quadratic Equations LOC: 11.RF5

TOP: Relations and Functions KEY: Procedural Knowledge

 **18.** ANS: D PTS: 0 DIF: Moderate

REF: 3.3 Using Square Roots to Solve Quadratic Equations LOC: 11.RF5

TOP: Relations and Functions KEY: Procedural Knowledge

 **19.** ANS: A PTS: 0 DIF: Easy

REF: 3.4 Developing and Applying the Quadratic Formula LOC: 11.RF5

TOP: Relations and Functions KEY: Conceptual Understanding

 **20.** ANS: D PTS: 0 DIF: Moderate

REF: 3.4 Developing and Applying the Quadratic Formula LOC: 11.RF5

TOP: Relations and Functions KEY: Procedural Knowledge

**SHORT ANSWER**

 **1.** ANS:

 is not a factor of the trinomial.

PTS: 0 DIF: Moderate REF: 3.1 Factoring Polynomial Expressions

LOC: 11.RF1 TOP: Relations and Functions KEY: Procedural Knowledge

 **2.** ANS:

 is a factor of the trinomial.

PTS: 0 DIF: Moderate REF: 3.1 Factoring Polynomial Expressions

LOC: 11.RF1 TOP: Relations and Functions KEY: Procedural Knowledge

 **3.** ANS:



PTS: 0 DIF: Moderate REF: 3.1 Factoring Polynomial Expressions

LOC: 11.RF1 TOP: Relations and Functions KEY: Procedural Knowledge

 **4.** ANS:



PTS: 0 DIF: Moderate REF: 3.1 Factoring Polynomial Expressions

LOC: 11.RF1 TOP: Relations and Functions KEY: Procedural Knowledge

 **5.** ANS:



PTS: 0 DIF: Moderate REF: 3.1 Factoring Polynomial Expressions

LOC: 11.RF1 TOP: Relations and Functions KEY: Procedural Knowledge

 **6.** ANS:



PTS: 0 DIF: Moderate REF: 3.2 Solving Quadratic Equations by Factoring

LOC: 11.RF5 TOP: Relations and Functions

KEY: Problem-Solving Skills | Procedural Knowledge

 **7.** ANS:

*x* = 

PTS: 0 DIF: Moderate REF: 3.2 Solving Quadratic Equations by Factoring

LOC: 11.AN3 TOP: Algebra and Number KEY: Procedural Knowledge

 **8.** ANS:

*x =*  or *x* = –3

PTS: 0 DIF: Moderate REF: 3.2 Solving Quadratic Equations by Factoring

LOC: 11.RF5 TOP: Relations and Functions KEY: Procedural Knowledge

 **9.** ANS:

*x* =  or *x* = 

PTS: 0 DIF: Moderate REF: 3.2 Solving Quadratic Equations by Factoring

LOC: 11.RF5 TOP: Relations and Functions KEY: Procedural Knowledge

 **10.** ANS:



PTS: 0 DIF: Easy REF: 3.3 Using Square Roots to Solve Quadratic Equations

LOC: 11.RF5 TOP: Relations and Functions KEY: Procedural Knowledge

 **11.** ANS:

There are two numbers:  or 

PTS: 0 DIF: Moderate REF: 3.3 Using Square Roots to Solve Quadratic Equations

LOC: 11.RF5 TOP: Relations and Functions

KEY: Problem-Solving Skills | Procedural Knowledge

 **12.** ANS:

Approximately 9.6 m

PTS: 0 DIF: Moderate REF: 3.3 Using Square Roots to Solve Quadratic Equations

LOC: 11.RF5 TOP: Relations and Functions

KEY: Problem-Solving Skills | Procedural Knowledge

 **13.** ANS:



PTS: 0 DIF: Easy REF: 3.4 Developing and Applying the Quadratic Formula

LOC: 11.AN2 TOP: Algebra and Number KEY: Procedural Knowledge

 **14.** ANS:

Approximately 18.1 s

PTS: 0 DIF: Moderate REF: 3.4 Developing and Applying the Quadratic Formula

LOC: 11.RF5 TOP: Relations and Functions

KEY: Problem-Solving Skills | Procedural Knowledge

 **15.** ANS:

a) 

b) The discriminant is positive, so there are 2 real roots.

PTS: 0 DIF: Moderate REF: 3.5 Interpreting the Discriminant

LOC: 11.RF5 TOP: Relations and Functions

KEY: Conceptual Understanding | Procedural Knowledge

 **16.** ANS:

a) 

b) The discriminant is positive, so there are 2 real roots.

PTS: 0 DIF: Moderate REF: 3.5 Interpreting the Discriminant

LOC: 11.RF5 TOP: Relations and Functions

KEY: Conceptual Understanding | Procedural Knowledge

 **17.** ANS:

a) 

b) The square root of the discriminant is rational, so the roots are rational.

PTS: 0 DIF: Moderate REF: 3.5 Interpreting the Discriminant

LOC: 11.RF5 TOP: Relations and Functions

KEY: Conceptual Understanding | Procedural Knowledge

 **18.** ANS:

Since the discriminant is negative, the equation has no real roots, and the rocket does not reach a height of 30 m.

PTS: 0 DIF: Moderate REF: 3.5 Interpreting the Discriminant

LOC: 11.RF5 TOP: Relations and Functions

KEY: Conceptual Understanding | Problem-Solving Skills

 **19.** ANS:

a) 

b) The discriminant is a perfect square, so use factoring.

 *x* =  or *x* = 3

PTS: 0 DIF: Moderate REF: 3.5 Interpreting the Discriminant

LOC: 11.RF5 TOP: Relations and Functions

KEY: Conceptual Understanding | Procedural Knowledge

 **20.** ANS:

a) 

b) The discriminant is not a perfect square, so use the quadratic formula.

 

PTS: 0 DIF: Moderate REF: 3.5 Interpreting the Discriminant

LOC: 11.RF5 TOP: Relations and Functions

KEY: Conceptual Understanding | Procedural Knowledge

**PROBLEM**

 **1.** ANS:

Find 2 numbers with sum –10 and product –11.

The numbers are 1 and –11.



PTS: 0 DIF: Difficult REF: 3.1 Factoring Polynomial Expressions

LOC: 11.RF1 TOP: Relations and Functions

KEY: Communication | Problem-Solving Skills

 **2.** ANS:

The first 3 terms are a perfect-square trinomial.



 Use the difference of squares.



PTS: 0 DIF: Difficult REF: 3.1 Factoring Polynomial Expressions

LOC: 11.RF1 TOP: Relations and Functions

KEY: Communication | Problem-Solving Skills

 **3.** ANS:

|  |  |
| --- | --- |
|  | Square each side of the equation.Combine like terms.Factor.Solve using the zero product property. |

Either  or 

Check for extraneous roots.

In , substitute:  and 

|  |  |
| --- | --- |
| L.S. R.S.  | L.S. R.S.  |

For , the left side does not equal the right side, so  is not a root of the radical equation.

For , the left side is equal to the right side, so this solution is verified.

The root is: 

PTS: 0 DIF: Difficult REF: 3.2 Solving Quadratic Equations by Factoring

LOC: 11.AN3 TOP: Algebra and Number

KEY: Communication | Problem-Solving Skills

 **4.** ANS:

The student should not have taken the square root of each side to solve the equation.

The correct solution is:



PTS: 0 DIF: Moderate REF: 3.2 Solving Quadratic Equations by Factoring

LOC: 11.RF5 TOP: Relations and Functions

KEY: Communication | Problem-Solving Skills

 **5.** ANS:



The roots are:  and 

PTS: 0 DIF: Moderate REF: 3.3 Using Square Roots to Solve Quadratic Equations

LOC: 11.RF5 TOP: Relations and Functions

KEY: Communication | Problem-Solving Skills

 **6.** ANS:

The student should have added 18 () instead of 9 to the right side of the equation.



The roots are:  and 

PTS: 0 DIF: Difficult REF: 3.3 Using Square Roots to Solve Quadratic Equations

LOC: 11.RF5 TOP: Relations and Functions

KEY: Communication | Problem-Solving Skills

 **7.** ANS:

a) The equation is not quadratic because it contains an -term.

b) I could write the equation as: , then use the quadratic formula.

c) Substitute:  in: 

 

  or 

 The roots of the equation are: 6, –6, 4, and –4

PTS: 0 DIF: Difficult REF: 3.4 Developing and Applying the Quadratic Formula

LOC: 11.RF5 TOP: Relations and Functions

KEY: Communication | Problem-Solving Skills

 **8.** ANS:

For an equation to have two real roots, 

Substitute: 



For  to have two real roots, *k* must be less than 3.

Sample response: A possible value of *k* is 2. So, an equation with two real roots is: 

PTS: 0 DIF: Moderate REF: 3.5 Interpreting the Discriminant

LOC: 11.RF5 TOP: Relations and Functions

KEY: Communication | Problem-Solving Skills

 **9.** ANS:

For an equation to have no real roots, 

Substitute: 

 

For  to have no real roots, *k* must be greater than .

Sample response: A possible value of *k* is 3. So, an equation with no real roots is: 

PTS: 0 DIF: Moderate REF: 3.5 Interpreting the Discriminant

LOC: 11.RF5 TOP: Relations and Functions

KEY: Communication | Problem-Solving Skills

 **10.** ANS:

For an equation to have two rational roots, its discriminant must be a perfect square.

In , substitute: 



Sample response:

Use guess and test.

One perfect square is 25.



Another perfect square is 49.



PTS: 0 DIF: Difficult REF: 3.5 Interpreting the Discriminant

LOC: 11.RF5 TOP: Relations and Functions

KEY: Communication | Problem-Solving Skills