***Section* 1.3 − Quadratic Functions**

***Basic Complex Number***

  

The number *i* is called the ***imaginary unit***.

***Example***









***Complex number*** is written in a form: 

*a* is the real part

*b* is the imaginary part

**Conjugate** of a complex number 

A ***quadratic equation*** in *x* is an equation that can be written in the general form:

 where *a, b,* and c are real numbers,

 

**Solving Quadratic Equations by *Factoring***

**The Zero-Product Principle**

If *AB* = 0 then *A* = 0 or *B* = 0.

***Example***

Solve 

***Solution***



 

 

***The Square Root Property***

If *u* is an algebraic expression and *d* is a nonzero real number, then u2 = *d* has exactly two solutions:



Equivalently,

.

***Example***

Solve 3*x*2 – 21 = 0

***Solution***







***Example***

Solve 5*x*2 + 45 = 0

***Solution***









***Example***

Solve (*x* + 5)2 = 11

***Solution***

***x*** + 5 = 



***Completing the Square***

If is a binomial, then by ***adding*** which is the square of half the coefficient of *x.* a perfect square trinomial will result. That is.

 

***Example***

Solve: 

***Solution***









*x* + 2 = 



***Quadratic Formula***

**(*Using Completing the Square*)**





















\*\*\* 



***Example***

Solve: 

***Solution***

 

 ***or***

=  

 

 

 

***Example***

Solve 

***Solution***

  











***Example***

Solve: 

***Solution***





 

 

 

 



*If* ***a + b + c* = 0** 

***Example***



 

*If* ***a − b + c* = 0** 

***Example***



 

***Exercises Section* 1.3 − Quadratic Functions**

(**1 – 48**) Solve

|  |  |  |
| --- | --- | --- |
|  |  |  |

(**49 – 60**) Solve using formula

|  |  |  |
| --- | --- | --- |
|  |  |  |

1. Solve for the specified variable 
2. Solve for the specified variable 