

Quadratic Factor Example

Math 130 Kovitz

Solve for x .

$$-\frac{1}{3}x^2 + x - \frac{2}{3} = 0.$$

Decide on a method of solution. Then either leave the x terms isolated on the left side (if completing the square) or set the right side to 0 (if factoring or using the quadratic formula).

Do not divide both sides by the coefficient after factoring out an x . That's definitely not correct; it is not a linear equation, so methods for solving a linear equation are not applicable.

It is always a good idea to check the solutions in the *original* equation, using a calculator if necessary.

$$(-3)\left(-\frac{1}{3}\right) + (-3)x + (-3)\left(-\frac{2}{3}\right) = 0. \quad \text{Multiply each term by } -3.$$

This will clear the fractions and make the coefficient of the x^2 positive.

$$x^2 - 3x + 2.$$

Try to factor this expression. Use trial and error.

$$(x - 2)(x - 1) = 0.$$

Both numbers must be negative and they must add to -3 and have a product of 2.

$$x = 2. \quad \text{or} \quad x = 1.$$

Check the answers.

$$-\frac{1}{3}(2^2) + 2 - \frac{2}{3} = -\frac{4}{3} + 2 - \frac{2}{3} = 0..$$

It checks.

and

$$-\frac{1}{3}(1^2) + 1 - \frac{2}{3} = 0.$$

So, both answers check.