



Bridge CST – SN4
Extra Practice
Solving Quadratic Equations

Quadratic Equation (Quadratic Formula)



1. Recognize that it is a quadratic equation
2. Once you decide to use the Quadratic Formula, make sure it is written in general form.

$$ax^2 + bx + c = 0$$

1. Identify the values of a, b, and c.
2. Always write the formula
3. Carefully, substitute the values of a, b and c in formula.
4. Simplify by applying your BEDMAS rules



- Solutions are rounded to nearest hundredth.
- The following slides will provide all steps for each question..

#1	$\{-0.4, 1\}$	#2	$\{-1.67, -1\}$
#3	$\{-3, 0.5\}$	#4	$\{-5.42, 4.42\}$
#5	$\{-2, 0.5\}$	#6	$\{-3.29, -0.71\}$
#7	$\{-1, 4.7\}$	#8	$\{-0.59, 8.59\}$
#9	$\{-6.86, -0.15\}$	#10	$\{-0.80, 1.55\}$
#11	$\{-1.17, 1.92\}$	#12	$\{-2.61, 2.11\}$
#13	$\{0.11, 1.14\}$	#14	$\{0.21, 4.79\}$
#15	$\{0.71, 2\}$	#16	no solution
#17	$\{0.87, 3.47\}$		

#1

$$5x^2 - 3x - 2 = 0$$

$$a = 5 \quad b = -3 \quad c = -2$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-(-3) \pm \sqrt{(-3)^2 - 4(5)(-2)}}{2(5)}$$

$$x = \frac{3 \pm \sqrt{9 + 40}}{10}$$

$$x = \frac{3 \pm \sqrt{49}}{10}$$

Cont.



#1

$$5x^2 - 3x - 2 = 0$$

$$x = \frac{3 \pm \sqrt{49}}{10}$$

$$x = \frac{3 \pm 7}{10}$$

$$x = \frac{3 - 7}{10}$$

$$x = \frac{-4}{10}$$

$$x = -0.4$$

$$x = \frac{3 + 7}{10}$$

$$x = \frac{10}{10}$$

$$x = 1$$

To the nearest hundredth, the solutions are

$\{-0.4, 1\}$

#2

$$3x^2 + 8x + 5 = 0$$

$$a = 3 \quad b = 8 \quad c = 5$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-(8) \pm \sqrt{(8)^2 - 4(3)(5)}}{2(3)}$$

$$x = \frac{-8 \pm \sqrt{64 - 60}}{6}$$

$$x = \frac{-8 \pm \sqrt{4}}{6}$$

Cont.



#2

$$3x^2 + 8x + 5 = 0$$

$$x = \frac{-8 \pm \sqrt{4}}{6}$$

$$x = \frac{-8 \pm 2}{6}$$

$$x = \frac{-8 + 2}{6}$$

$$x = \frac{-6}{6}$$

$$x = -1$$

$$x = \frac{-8 - 2}{6}$$

$$x = \frac{-10}{6}$$

$$x = -1.67$$



To the nearest hundredth, the solutions are $\{-1.67, -1\}$

#3

$$-2x^2 - 5x + 3 = 0$$

$$a = -2 \quad b = -5 \quad c = 3$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-(-5) \pm \sqrt{(-5)^2 - 4(-2)(3)}}{2(-2)}$$

$$x = \frac{5 \pm \sqrt{25 + 24}}{-4}$$

$$x = \frac{5 \pm \sqrt{49}}{-4}$$

Cont.



#3

$$-2x^2 - 5x + 3 = 0$$

$$x = \frac{5 \pm \sqrt{49}}{-4}$$

$$x = \frac{5 \pm 7}{-4}$$

$$x = \frac{5 + 7}{-4}$$

$$x = \frac{12}{-4}$$

$$x = -3$$

$$x = \frac{5 - 7}{-4}$$

$$x = \frac{-2}{-4}$$

$$x = 0.5$$



To the nearest hundredth, the solutions are $\{-3, 0.5\}$

#4

$$4(x + 7) = (x + 2)^2 + x$$

$$4x + 28 = (x + 2)(x + 2) + x$$

$$4x + 28 = x^2 + 2x + 2x + 4 + x$$

$$4x + 28 = x^2 + 5x + 4$$

$$4x - 4x + 28 - 28 = x^2 + 5x - 4x + 4 - 28$$
 Cont.

$$0 = x^2 + x - 24$$



#4

$$0 = x^2 + x - 24$$

$$a = 1 \quad b = 1 \quad c = -24$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-1 \pm \sqrt{(1)^2 - 4(1)(-24)}}{2(1)}$$

$$x = \frac{-1 \pm \sqrt{1 + 96}}{2}$$

$$x = \frac{-1 \pm \sqrt{97}}{2}$$

Cont.



#4

$$0 = x^2 + x - 24$$

$$x = \frac{-1 \pm \sqrt{97}}{2}$$

$$x = \frac{-1 \pm 9.8488}{2}$$

$$x = \frac{-1 - 9.8488}{2}$$

$$x = \frac{-10.8488}{2}$$

$$x = -5.4244$$

$$x = \frac{-1 + 9.8488}{2}$$

$$x = \frac{8.8488}{2}$$

$$x = 4.4244$$



To the nearest hundredth, the solutions are $\{-5.42, 4.42\}$

#5

$$2x^2 + 3x - 2 = 0$$

$$a = 2 \quad b = 3 \quad c = -2$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-3 \pm \sqrt{(3)^2 - 4(2)(-2)}}{2(2)}$$

$$x = \frac{-3 \pm \sqrt{9 + 16}}{4}$$

$$x = \frac{-3 \pm \sqrt{25}}{4}$$

Cont.



#5

$$2x^2 + 3x - 2 = 0$$

$$x = \frac{-3 \pm \sqrt{25}}{4}$$

$$x = \frac{-3 \pm 5}{4}$$

$$x = \frac{-3 + 5}{4}$$

$$x = \frac{2}{4}$$

$$x = 0.5$$

$$x = \frac{-3 - 5}{4}$$

$$x = \frac{-8}{4}$$


$$x = -2$$



To the nearest hundredth, the solutions are $\{-2, 0.5\}$

#6

FOIL

$$(3x - 1)(x + 5) = 2(x - 6)$$


$$3x^2 + 15x - x - 5 = 2x - 12$$

$$3x^2 + 14x - 5 = 2x - 12$$

$$3x^2 + 14x - 2x - 5 + 12 = 2x - 2x - 12 + 12$$

$$3x^2 + 12x + 7 = 0$$

Simplify and change to
general form.

$$ax^2 + bx + c = 0$$

Cont.



#6

$$3x^2 + 12x + 7 = 0$$

$$a = 3 \quad b = 12 \quad c = 7$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-(12) \pm \sqrt{(12)^2 - 4(3)(7)}}{2(3)}$$

$$x = \frac{-12 \pm \sqrt{144 - 84}}{6}$$

$$x = \frac{-12 \pm \sqrt{60}}{6}$$

$$x = \frac{-12 \pm 7.75}{6}$$

Cont.



#6

$$3x^2 + 12x + 7 = 0$$

$$x = \frac{-12 \pm \sqrt{60}}{6}$$

$$x = \frac{-12 \pm 7.75}{6}$$

$$x = \frac{-12 + 7.75}{6}$$


$$x = \frac{-4.25}{6}$$

$$x = -0.71$$

$$x = \frac{-12 - 7.75}{6}$$

$$x = \frac{-19.75}{6}$$

$$x = -3.29$$



To the nearest hundredth, the solutions are $\{-3.29, -0.71\}$

$$\#7 \quad (2x - 1)^2 - 3 = (x + 3)(x + 4)$$

Change to general form.

$$ax^2 + bx + c = 0$$

FOIL

FOIL

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

$$4x^2 - 2x - 2x + 1 - 3 = x^2 + 4x + 3x + 12$$

$$4x^2 - 4x - 2 = x^2 + 7x + 12$$

$$4x^2 - x^2 - 4x - 7x - 2 - 12 = x^2 - x^2 + 7x - 7x + 12 - 12$$

$$3x^2 - 11x - 14 = 0$$

Cont.



#7

$$3x^2 - 11x - 14 = 0$$

$$a = 3 \quad b = -11 \quad c = -14$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-(-11) \pm \sqrt{(-11)^2 - 4(3)(-14)}}{2(3)}$$

$$x = \frac{11 \pm \sqrt{121 + 168}}{6}$$

$$x = \frac{11 \pm \sqrt{289}}{6}$$

Cont.



#7

$$3x^2 - 11x - 14 = 0$$

$$x = \frac{11 \pm \sqrt{289}}{6}$$

$$x = \frac{11 \pm 17}{6}$$

$$x = \frac{11 + 17}{6}$$

$$x = \frac{28}{6}$$

$$x = 4.7$$

$$x = \frac{11 - 17}{6}$$

$$x = \frac{-6}{6}$$

$$x = -1$$



To the nearest hundredth, the solutions are $\{-1, 4.7\}$

#8

$$x^2 - 8x - 5 = 0$$

$$a = 1 \quad b = -8 \quad c = -5$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-(-8) \pm \sqrt{(-8)^2 - 4(1)(-5)}}{2(1)}$$

$$x = \frac{8 \pm \sqrt{64 + 20}}{2}$$

$$x = \frac{8 \pm \sqrt{84}}{2}$$

Cont.



#8

$$x^2 - 8x - 5 = 0$$

$$x = \frac{8 \pm \sqrt{84}}{2}$$

$$x = \frac{8 \pm 9.17}{2}$$

$$x = \frac{8 + 9.17}{2}$$

$$x = \frac{17.17}{2}$$

$$x = 8.59$$

$$x = \frac{8 - 9.17}{2}$$

$$x = \frac{-1.17}{2}$$

$$x = -0.59$$

To the nearest
hundredth, the
solutions are

$$\{-0.59, 8.59\}$$

#9

$$x^2 + 7x + 1 = 0$$

$$a = 1 \quad b = 7 \quad c = 1$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-(7) \pm \sqrt{(7)^2 - 4(1)(1)}}{2(1)}$$

$$x = \frac{-7 \pm \sqrt{49 - 4}}{2}$$

$$x = \frac{-7 \pm \sqrt{45}}{2}$$

Cont.



#9

$$x^2 + 7x + 1 = 0$$

$$x = \frac{-7 \pm \sqrt{45}}{2}$$

$$x = \frac{-7 \pm 6.71}{2}$$

$$x = \frac{-7 + 6.71}{2}$$

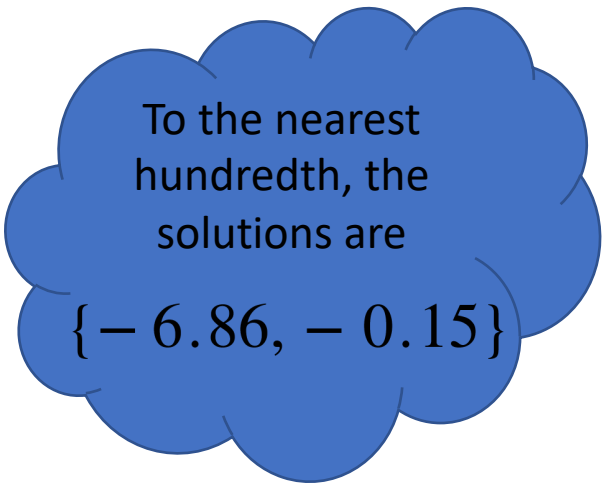
$$x = \frac{-0.29}{2}$$

$$x = -0.15$$

$$x = \frac{-7 - 6.71}{2}$$

$$x = \frac{-13.71}{2}$$

$$x = -6.86$$



To the nearest hundredth, the solutions are
 $\{-6.86, -0.15\}$

#10

$$-4x^2 + 3x + 5 = 0$$

$$a = -4 \quad b = 3 \quad c = 5$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-(3) \pm \sqrt{(3)^2 - 4(-4)(5)}}{2(-4)}$$

$$x = \frac{-3 \pm \sqrt{9 + 80}}{-8}$$

$$x = \frac{-3 \pm \sqrt{89}}{-8}$$

Cont.



#10

$$-4x^2 + 3x + 5 = 0$$

$$x = \frac{-3 \pm \sqrt{89}}{-8}$$

$$x = \frac{-3 \pm 9.43}{-8}$$

$$x = \frac{-3 + 9.43}{-8}$$

$$x = \frac{6.43}{-8}$$

$$x = -0.80$$

$$x = \frac{-3 - 9.43}{-8}$$

$$x = \frac{-12.43}{-8}$$

$$x = 1.55$$



To the nearest hundredth, the solutions are $\{-0.80, 1.55\}$

#11

$$4x^2 = 3x + 9 \dots$$

$$4x^2 - 3x - 9 = 0$$

$$a = 4 \quad b = -3 \quad c = -9$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-(-3) \pm \sqrt{(-3)^2 - 4(4)(-9)}}{2(4)}$$

$$x = \frac{3 \pm \sqrt{9 + 144}}{8}$$

$$x = \frac{3 \pm \sqrt{153}}{8}$$

Change to general form.

$$ax^2 + bx + c = 0$$

Cont.



#11

$$4x^2 = 3x + 9$$

$$x = \frac{3 \pm \sqrt{153}}{8}$$

$$x = \frac{3 \pm 12.37}{8}$$

$$x = \frac{3 + 12.37}{8}$$

$$x = \frac{15.37}{8}$$

$$x = 1.92$$

$$x = \frac{3 - 12.37}{8}$$

$$x = \frac{-9.37}{8}$$

$$x = -1.17$$



To the nearest hundredth, the solutions are $\{-1.17, 1.92\}$

#12

FOIL



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

Simplify and change to
general form.

$$ax^2 + bx + c = 0$$

$$2x^2 + 6x - x - 3 = 4x + 8$$

$$2x^2 + 5x - 3 = 4x + 8$$

$$2x^2 + 5x - 4x - 3 - 8 = 4x - 4x + 8 - 8$$

$$2x^2 + x - 11 = 0$$

Cont.



#12

$$2x^2 + x - 11 = 0$$

$$a = 2 \quad b = 1 \quad c = -11$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-(1) \pm \sqrt{(1)^2 - 4(2)(-11)}}{2(2)}$$

$$x = \frac{-1 \pm \sqrt{1 + 88}}{4}$$

$$x = \frac{-1 \pm \sqrt{89}}{4}$$

Cont.



#12

$$2x^2 + 4x - 11 = 0$$

$$x = \frac{-1 \pm \sqrt{89}}{4}$$

$$x = \frac{-1 \pm 9.43}{4}$$

$$x = \frac{-1 + 9.43}{4}$$

$$x = \frac{8.43}{4}$$

$$x = 2.11$$

$$x = \frac{-1 - 9.43}{4}$$

$$x = \frac{-10.43}{4}$$

$$x = -2.61$$

To the nearest hundredth, the solutions are $\{-2.61, 2.11\}$

#13

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

FOIL

FOIL

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

$$9x^2 - 3x - 3x + 1 = 2x^2 + 2x + 2x + 4 - 4$$

$$9x^2 - 6x + 1 = x^2 + 4x$$

$$9x^2 - x^2 - 6x - 4x + 1 = x^2 - x^2 + 4x - 4x$$

$$8x^2 - 10x + 1 = 0$$

Simplify and change to
general form.

$$ax^2 + bx + c = 0$$

Cont.



#13

$$8x^2 - 10x + 1 = 0$$

$$a = 8 \quad b = -10 \quad c = 1$$

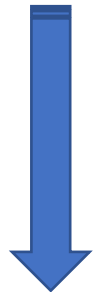
$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-(-10) \pm \sqrt{(-10)^2 - 4(8)(1)}}{2(8)}$$

$$x = \frac{10 \pm \sqrt{100 - 32}}{16}$$

$$x = \frac{10 \pm \sqrt{68}}{16}$$

Cont.



#13

$$8x^2 - 10x + 1 = 0$$

$$x = \frac{10 \pm \sqrt{68}}{16}$$

$$x = \frac{10 \pm 8.25}{16}$$

$$x = \frac{10 + 8.25}{16}$$

$$x = \frac{18.25}{16}$$

$$x = 1.14$$

$$x = \frac{10 - 8.25}{16}$$

$$x = \frac{1.75}{16}$$

$$x = 0.11$$



To the nearest hundredth, the solutions are
{0.11, 1.14}

#14

$$x^2 - 5x + 1 = 0$$

$$a = 1 \quad b = -5 \quad c = 1$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-(-5) \pm \sqrt{(-5)^2 - 4(1)(1)}}{2(1)}$$

$$x = \frac{5 \pm \sqrt{25 - 4}}{2}$$

$$x = \frac{5 \pm \sqrt{21}}{2}$$

Cont.



#14

$$x^2 - 5x + 1 = 0$$

$$x = \frac{5 \pm \sqrt{21}}{2}$$

$$x = \frac{5 \pm 4.58}{2}$$

$$x = \frac{5 + 4.58}{2}$$

$$x = \frac{9.58}{2}$$

$$x = 4.79$$

$$x = \frac{5 - 4.58}{2}$$

$$x = \frac{0.42}{2}$$

$$x = 0.21$$



To the nearest hundredth, the solutions are $\{0.21, 4.79\}$

#15

$$7x^2 = 19x - 10 \dots$$

Change to general form.
 $ax^2 + bx + c = 0$

$$7x^2 - 19x + 10 = 0$$

$$a = 7 \quad b = -19 \quad c = 10$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-(-19) \pm \sqrt{(-19)^2 - 4(7)(10)}}{2(7)}$$

$$x = \frac{19 \pm \sqrt{361 - 280}}{14}$$

$$x = \frac{19 \pm \sqrt{81}}{14}$$

Cont.



#15

$$7x^2 = 19x - 10$$

$$x = \frac{19 \pm \sqrt{81}}{14}$$

$$x = \frac{19 \pm 9}{14}$$

$$x = \frac{19 + 9}{14}$$

$$x = \frac{28}{14}$$

$$x = 2$$

$$x = \frac{19 - 9}{14}$$

$$x = \frac{10}{14}$$

$$x = 0.71$$



To the nearest hundredth, the solutions are $\{0.71, 2\}$

#16

$$2x^2 = 3x - 5$$

$$2x^2 - 3x + 5 = 0$$

$$a = 2 \quad b = -3 \quad c = 5$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-(-3) \pm \sqrt{(-3)^2 - 4(2)(5)}}{2(2)}$$

$$x = \frac{3 \pm \sqrt{9 - 40}}{4}$$

$$x = \frac{3 \pm \sqrt{-31}}{4}$$


Change to general form.

$$ax^2 + bx + c = 0$$



There is no solution because the square root of -31 is a non-real number.

#17

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


FOIL

$$(2x - 3)(2x - 3) + x - x^2 = 2x$$

$$4x^2 - 6x - 6x + 9 + x - x^2 = 2x$$

$$3x^2 - 11x + 9 = 2x$$

$$3x^2 - 11x - 2x + 9 = 2x - 2x$$

$$3x^2 - 13x + 9 = 0$$

Simplify and change to
general form.

$$ax^2 + bx + c = 0$$

Cont.



#17

$$3x^2 - 13x + 9 = 0$$

$$a = 3 \quad b = -13 \quad c = 9$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-(-13) \pm \sqrt{(-13)^2 - 4(3)(9)}}{2(3)}$$

$$x = \frac{13 \pm \sqrt{169 - 108}}{6}$$

$$x = \frac{13 \pm \sqrt{61}}{6}$$

Cont.



#17

$$3x^2 - 13x + 9 = 0$$

$$x = \frac{13 \pm \sqrt{61}}{6}$$

$$x = \frac{13 \pm 7.81}{6}$$

$$x = \frac{13 + 7.81}{6}$$

$$x = \frac{20.81}{6}$$

$$x = 3.47$$

$$x = \frac{13 - 7.81}{6}$$

$$x = \frac{5.19}{6}$$

$$x = 0.87$$

To the nearest hundredth, the solutions are $\{0.87, 3.47\}$