Quadratic Formula

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Quadratic equation will always be in the form

$ax^2+bx+c=0$

where a is the coefficient of x^2
b is the coefficient of x
c is the constant.

} The value in front of the variable - coefficient.

Log Tables Pg 20

Formula $X=\dfrac{-b\pm\sqrt{b^2-4ac}}{2a}$

Eg1) Solve $\overset{a}{1}x^2+\overset{b}{4}x+\overset{c}{2}=0$, to two decimal places.

① Find a, b and c from the given quadratic

$a=1$
$b=+4$
$c=2$

} Sub these values into quadratic formula.

- Use brackets when subsituting

Calculator = $\dfrac{\square}{\square}$

$X=\dfrac{-(4)\pm\sqrt{(4)^2-4(1)(2)}}{2(1)}$

calculator

(+)

Surd form

$-2+\sqrt{2}$

[SD]

-0.5857

Ans $=-0.59$

(−)

Q2 Pg 142

$\overset{a}{1}x^2+\overset{b}{6}x+\overset{c}{4}=0$

$a=1$
$b=+6$
$c=4$

} $\dfrac{-b\pm\sqrt{b^2-4ac}}{2a}$

$\dfrac{-(6)\pm\sqrt{(6)^2-4(1)(4)}}{2(1)}$

Pg 142
Q2.

surd form

$-2-\sqrt{2}$

[SD]

-3.414

Ans = $-3.41\dot{4}$

(+) $-3+\sqrt{5}$ surd

[SD]

-0.7639

-0.76

(−) $-3-\sqrt{5}$

[SD]

-5.236

-5.24

HW Pg 142 Q3 $x^2+2x-5=0$

Q4 $x^2-2x-7=0$

T&T2 8.2
Using the...

chapter 8

Quadratic equations

142

Section 8.2 Using the quadratic formula

Example 1

Use the quadratic formula to find the roots of the equation $5x^2 + 7x - 3 = 0$, correct to two decimal places.

Exercise 8.2

Solve the following equations using the formula

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

Give your answers correct to two decimal places.

1. $x^2 + 4x + 2 = 0$

Solve the following equations using the formula

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

Give your answers correct to two decimal places.

2. $x^2 + 6x + 4 = 0$

Solve the following equations using the formula

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

Give your answers correct to two decimal places.

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

$a = 1$, $b = +2$, $c = -5$

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

(+) $-1 + \sqrt{6}$

[SD]

1.449

1.45

(−) $-1 - \sqrt{6}$

[SD]

−3.449

−3.45

Solve the following equations using the formula

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

Give your answers correct to two decimal places.

4. $x^2 - 2x - 7 = 0$

$a = 1$, $b = -2$, $c = -7$

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

$+$: $1 + 2\sqrt{2}$ [SD] $3.828\ldots$ 3.83

$-$: $1 - 2\sqrt{2}$ [SD] $-1.828\ldots$ -1.83

Solve the following equations using the formula

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

Give your answers correct to two decimal places.

5. $4x^2 + 2x - 1 = 0$

Solve the following equations using the formula

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

Give your answers correct to two decimal places.

6. $3x^2 - x - 1 = 0$

Solve the following equations using the formula

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

Give your answers correct to two decimal places.

7. $3x^2 - 6x + 2 = 0$

Solve the following equations using the formula

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

Give your answers correct to two decimal places.

8. $3x^2 + 7x - 5 = 0$

Solve the following equations using the formula

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

Give your answers correct to two decimal places.

9. $5x^2 - 4x - 2 = 0$

Solve the following equations using the formula

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

Give your answers correct to two decimal places.

10. $3x^2 + 8x + 2 = 0$

Solve the following equations using the formula

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

Give your answers correct to two decimal places.

11. $6x^2 - 9x - 4 = 0$

Solve the following equations using the formula

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

Give your answers correct to two decimal places.

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

Solve the following equations using the formula

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

Give your answers correct to two decimal places.

13. $4x^2 + 3x = 5$

Solve the following equations using the formula

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

Give your answers correct to two decimal places.

14. $2x^2 = 7x - 4$

Solve the following equations using the formula

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

Give your answers correct to two decimal places.

15. $3x^2 + 5x = 3$

Answers

Exercise 8.2

1. $x = -3.41, -0.59$
2. $x = -5.24, -0.76$
3. $-3.45, 1.45$
4. $-1.83, 3.83$
5. $-0.81, 0.31$
6. $-0.43, 0.77$
7. $0.42, 1.58$
8. $-2.91, 0.57$
9. $-0.35, 1.15$
10. $-2.39, -0.28$
11. $-0.36, 1.86$
12. $-2.59, 0.26$
13. $-1.55, 0.80$
14. $0.72, 2.78$
15. $-2.14, 0.47$

Rearranging Quadratic to solve using -b formula.

Quadratic : $ax^2+bx+c=0$ Has to be in this form

Eg 1 Solve and give your answers to 1 decimal place.

ax^2 bx c

$3x^2+5x=3$

Must = 0

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

ax^2 bx c

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

$a=3$
$b=5$
$c=-3$
} Sub in

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

0.468

(+) $\cdot 5$ (−) -2.135

-2.1

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

Eg2) Solve the equation and give your answer to two decimal places.

ax^2+bx+c

c b a

$-1+2x+4x^2=0.$

$a=4$
$b=2$
$c=-1$
} Sub in

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

(+) $\cdot 309$ (−) $-\cdot 809$

$\cdot 31$ $-\cdot 81$

Class work → Home work

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