Solve Quadratic Equations Using Square Roots

Teacher Notes

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Solve Using Square Roots

Consider the following quadratic: $x^2 - 64 = 0$

One option is to factor to solve for x.

$$(x+8)(x-8) = 0$$

$$x = -8 \qquad x = 8$$

Because there is no "bx" term... another method to solve is using the square roots method.

To solve, move the constant, "c" to the other side of the equation and take the square root of each side.

$$x^2 - 64 = 0$$

$$x^2 = 64$$

$$\sqrt{x^2} = \sqrt{64}$$

$$x = 8 \qquad x = -8$$

IMPORTANT!! When taking the square root, you MUST consider both the positive and negative answer. Both 8^2 and $(-8)^2$ equal 64.

Solve Using Square Roots

You can solve a quadratic equation by the square root method if you can write it in the form:

$$x^2 = c$$

If x and c are algebraic expressions, then:

$$x = \sqrt{c} \qquad x = -\sqrt{c}$$

This can also be written as: $x = \pm\sqrt{c}$

Solve Using Square Roots

What if x^2 has a coefficient other than 1?

Example: Solve $4x^2 = 20$ using the square roots method.

Answer

26 When you take the square root of a real number, your answer will always be positive.

True

False

Answer

27 If $x^2 = 16$, then $x =$

A 4

B 2

C -2

D 26

E -4

Answer

28 Solve $5x^2 = 20$ using the square root method.

A	5	E	-5
B	20	F	2
C	4	G	-4
D	-2	H	-20

Answer

29 If $y^2 = 4$, then y =

A 4

B 2

C -2

D 26

E -4

Answer

30 If $8j^2 = 96$, then $j =$

A $-3\sqrt{2}$

B $-2\sqrt{3}$

C $2\sqrt{3}$

D $3\sqrt{2}$

E ± 12

Answer

31 If $4h^2 - 10 = 30$, then h =

A $-\sqrt{10}$

B $-2\sqrt{5}$

C $2\sqrt{5}$

D $\sqrt{10}$

E ± 10

Answer

32 If $(3g - 9)^2 + 7 = 43$, then $g =$

A 1

B $\frac{9-5\sqrt{2}}{3}$

C $\frac{9+5\sqrt{2}}{3}$

D 5

E ± 3

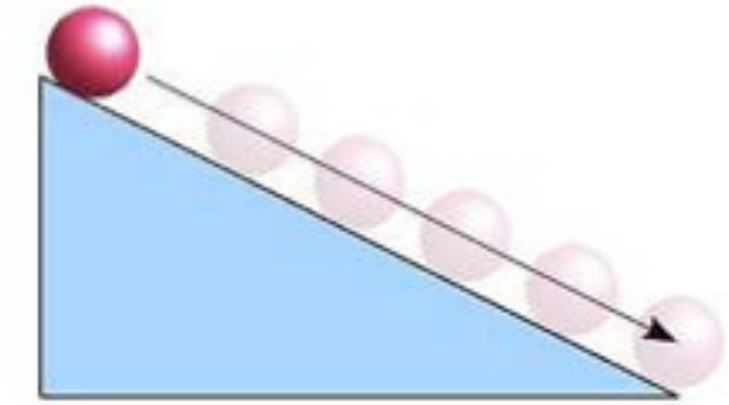
Answer

Solve Using Square Roots

Challenge: Solve $(2x - 1)^2 = 20$ using the square root method.

Answer

33 **A physics teacher put a ball at the top of a ramp and let it roll toward the floor. The class determined that the height of the ball could be represented by the equation, $h = -16t^2 + 4$,where the height, h, is measured in feet from the ground and time, t, in seconds. Determine the time it takes the ball to reach the floor.**



Teacher Notes

Problem is from:

engage^ny

Click link for exact lesson.

34 A rock is dropped from a 1000 foot tower. The height of the rock as a function of time can be modeled by the equation: $h(t) = -16t^2 + 1000$. How long does it take for the rock to reach the ground?

Answer