DO NOW

Solve: $a^2 - 49 = 0$

$(a-7)(a+7)=0$

$a-7=0$ | $a+7=0$

$a=7$ | $a=-7$

$ax^2+bx+c=0$

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Homework Answers:

1. -4

3. 0, -25

5. 3, -3

7. 3, -14

9. 9, -9

11. -6, -5

13. -7, 1

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Simplifying Radicals

The square root of every perfect square is a rational number.

$\sqrt{9}=3 \quad \sqrt{0}=0 \quad \sqrt{1.96}=1.4 \quad \sqrt{\frac{4}{49}}=\frac{2}{7}$

$\sqrt{48}$ is called a **radical**

48 is called the **radicand**

Product Property of Radicals

$$\sqrt{ab}=\sqrt{a}\bullet\sqrt{b}$$

Split a radicand into the product of its factors

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Steps to Simplify a Radical

Find two factors of the radicand so that one of the factors is a perfect square $\sqrt{27}$

Write the radical as the product of the square roots of the factors $\sqrt{9}\cdot\sqrt{3}$

Find the square root of the perfect square factor - answer is written as: $a\sqrt{b}$ $3\sqrt{3}$

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Ex: 1 Simplify: $\sqrt{48}$

$\sqrt{48}$

$\sqrt{16}\sqrt{3}$

$4\sqrt{3}$

$\sqrt{4}\sqrt{12}$

$2\sqrt{12}$

$2\sqrt{4}\sqrt{3}$

$2 \cdot 2\sqrt{3}$

$4\sqrt{3}$

Ex: 2 Simplify: $2\sqrt{12}$

$2\sqrt{4}\sqrt{3}$

$2 \cdot 2\sqrt{3}$

$4\sqrt{3}$

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Let's try some examples:

1. $\sqrt{50}$

$\sqrt{25}\sqrt{2}$

$5\sqrt{2}$

2. $\sqrt{72}$

$\sqrt{9}\sqrt{8}$

$3\sqrt{8}$

$3\sqrt{4}\sqrt{2}$

$3 \cdot 2\sqrt{2}$

$6\sqrt{2}$

$\sqrt{36}\sqrt{2}$

$6\sqrt{2}$

3. $4\sqrt{63}$

$4\sqrt{9}\sqrt{7}$

$4 \cdot 3\sqrt{7}$

$12\sqrt{7}$

4. $\frac{1}{2}\sqrt{12}$

$\frac{1}{2}\sqrt{4}\sqrt{3}$

$\frac{1}{2} \cdot 2\sqrt{3}$

$\sqrt{3}$

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Simplifying Radical Expressions

You can only combine LIKE RADICALS
(must have the same radicand)

1. $\sqrt{8}-10+2\sqrt{18}-4$

$\sqrt{4}\sqrt{2}-10+2\sqrt{9}\sqrt{2}-4$

$2\sqrt{2}-10+2\cdot3\sqrt{2}-4$

$2\sqrt{2}-10+6\sqrt{2}-4$

$8\sqrt{2}-14$

2. $4+\sqrt{48}+5-\sqrt{3}$

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Simplify each expression

1. $\dfrac{8+\sqrt{52}}{2}$

$\dfrac{8+\sqrt{4}\sqrt{13}}{2}$

$\dfrac{8+2\sqrt{13}}{2}$

$4+\sqrt{13}$

2. $\dfrac{-6-\sqrt{12}}{6}$

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