Mathematics Class Slides
Bronx Early College Academy

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28 April 2020

11.2 Literals, operations on radicals Tuesday 28 April

GQ: How do we apply algebra to equations with literals?

HSA.CED.A.4 Rearrange formulas to highlight a quantity of interest   11.2 Tuesday 28 April

Do Now: Deltamath (remember to submit "Present")

▶ Convert standard linear equations to y-intercept form

Lesson: Operations on radicals (square roots)
Collecting like terms

Pear Deck practice problems

Exit note: stay after if you need help

Take notes: Properties of square roots

Definition: $(\sqrt{a})^2 = a$ note: $(-\sqrt{a})^2 = a$

example:
$x^2 = 25$
$x = \sqrt{25} = 5$

check: $5^2 = 25$ but also $(-5)^2 = 25$

so, if $x^2 = 25$
then $x = \pm 5$

Addition of square roots: collect like terms

Addition
$$\sqrt{b} + \sqrt{b} = 2\sqrt{b}, \qquad \text{but } \sqrt{a} + \sqrt{b} = \sqrt{a} + \sqrt{b}$$

examples
$$2\sqrt{3} + 4\sqrt{3} = 6\sqrt{3}$$

$$5\sqrt{7} + 2\sqrt{11} + 3\sqrt{7} = 8\sqrt{7} + 2\sqrt{11}$$

Multiplying and factoring square roots

Multiplication
$$\sqrt{c} \times \sqrt{d} = \sqrt{cd}$$

examples
$$\sqrt{3} \times \sqrt{12} = \sqrt{3 \times 12} = \sqrt{36}$$

$$\sqrt{20} = \sqrt{4} \times \sqrt{5} = 2\sqrt{5}$$

Dividing square roots

Division, the multiplicative inverse (reciprocal)

$$\sqrt{\frac{j}{k}} = \frac{\sqrt{j}}{\sqrt{k}}$$

example

$$\sqrt{\frac{4}{9}} = \frac{\sqrt{4}}{\sqrt{9}} = \frac{2}{3}$$

Practice with radicals and literals

Simplify the expression by "collecting like terms"

$\sqrt{5} - x + 6\sqrt{5} + 2x$

Practice with radicals and literals

Solve for x. Start by "collecting like terms"

$4x + 6\sqrt{3} - 2x - 2\sqrt{3} = 10\sqrt{3}$

Practice with radicals and literals

Simplify the expression by "collecting like terms"

$5 + 2\sqrt{13} - 3 + 3\sqrt{13}$

Practice with radicals and literals

Simplify each expression by factoring and then simplifying a perfect square

$\sqrt{18}$

Practice with radicals and literals

Simplify each expression by factoring and then simplifying a perfect square

$\sqrt{50}$

Practice with radicals and literals

Simplify each expression by factoring and then simplifying a perfect square

1. $3x + 2x$
   - ☐ $5 + x$
   - ☐ $(x + x + x) + (x + x)$
   - ☐ $5x$
   - ☐ $(3 + 2)x$

2. $5\pi - 2\pi + 4\pi$
   - ☐ $3\pi + 4$
   - ☐ $(5 - 2 + 4)\pi$
   - ☐ $7 + \pi$
   - ☐ $7 \times \pi$

Practice with radicals and literals

Simplify each expression by "collecting like terms"

1. $3x - 2x + 7y$

3. $-k + 7\sqrt{2} + 2k + 3\sqrt{2}$

2. $5z + 5\pi - 2\pi + z$

4. $5\pi x - 2\pi x + 9y$

GQ: How do we apply algebra to equations with literals?

HSA.CED.A.4 Rearrange formulas to highlight a quantity of interest 11.1 Wed. 22 April

Solve each equation for the unknown

1. $\dfrac{k}{\sqrt{3}} = 11$

2. $5z - 2\pi = 4\pi + z$

GQ: How do we apply algebra to equations with literals?

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Solve each equation for the unknown

1. $4x - x\sqrt{3} = 11$ 2. $5\pi x - 2\pi x = \pi x + 14$