Name: _____ Period: _____ Date: _____

Simplifying Radicals Assignment

Write each expression in radical form.

1. $y^{\frac{4}{5}} =$

2. $(4c-3)^{\frac{3}{4}} =$

Write each expression in exponential form.

3. $\sqrt[5]{x^2} =$

4. $\sqrt{(2+a)} =$

Simplify the following expressions. Assume that all variables represent positive real numbers.

5. $\sqrt[4]{81} =$

6. $\sqrt{36a^6b^2} =$

7. $\sqrt{75} =$

8. $\sqrt[4]{\frac{48a^5}{b^8}} =$

9. $\sqrt[4]{162(3x+5)^8} =$

10. $\frac{\sqrt{50x^6}}{\sqrt{2x^4}} =$

Simplify the following expressions. Assume that all variables represent positive real numbers.

11. $\frac{2}{\sqrt{6}} =$

12. $\frac{12}{\sqrt[3]{4}} =$

13. $\frac{3}{10+\sqrt{5}} =$

14. $\frac{y-x}{\sqrt{y}-\sqrt{x}} =$

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Simplifying Radicals Assignment

Simplify radicals and recognize like or unlike radicals.

15. $2\sqrt{3}$; $3\sqrt{2}$;

16. $3\sqrt{6}$; $\sqrt{24}$

17. $\sqrt[3]{250}$; $\sqrt[3]{54}$; $\sqrt[3]{16}$

18. $\sqrt[4]{2a^4b^9}$; $6\sqrt[3]{2ab}$; $3\sqrt[4]{2ab^5}$

Simplify the following expressions. Assume that all variables represent positive real numbers.

19. $\left(\sqrt[5]{-32}\right)^2 =$

20. $\sqrt[5]{\sqrt{xy^3}} =$

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Simplifying Radicals Assignment

ANSWERS

Write each expression in radical form.

1. $y^{\frac{4}{5}} = \sqrt[5]{y^4}$

2. $(4c-3)^{\frac{3}{4}} = \sqrt[4]{(4c-3)^3}$

Write each expression in exponential form.

3. $\sqrt[5]{x^2} = x^{\frac{2}{5}}$

4. $\sqrt{(2+a)} = (2+a)^{\frac{1}{2}}$

Simplify each expression

5. $\sqrt[4]{81} = \sqrt[4]{3^4} = \pm 3$

6. $\sqrt{36a^6b^2} = \sqrt{6^2 * (a^3)^2 * b^2} = 6a^3b$

7. $\sqrt{75} = \sqrt{3 * 5^2} = 5\sqrt{3}$

8. $\sqrt[4]{\frac{48a^5}{b^8}} = \frac{\sqrt[4]{2^4 * 3 * a * a^4}}{\sqrt[4]{b^4 b^4}} = \frac{2a\sqrt[4]{3a}}{b^2}$

9. $\sqrt[4]{162(3x+5)^8} =$
$\sqrt[4]{2 * 3^4 * (3x+5)^4 * (3x+5)^4} =$
$= 3(3x+5)^2\sqrt[4]{2}$

10. $\frac{\sqrt{50x^6}}{\sqrt{2x^4}} = \sqrt{\frac{5^2 * 2 * (x^3)^2}{2 * (x^2)^2}} = \frac{5x^3}{x^2} = 5x$

Simplify the following expressions (rationalize the denominator)

11. $\frac{2}{\sqrt{6}} = \frac{2}{\sqrt{6}} * \frac{\sqrt{6}}{\sqrt{6}} = \frac{2\sqrt{6}}{6} = \frac{\sqrt{6}}{3}$

12. $\frac{12}{\sqrt[3]{4}} = \frac{12}{\sqrt[3]{4}} * \frac{\sqrt[3]{4^2}}{\sqrt[3]{4^2}} = \frac{12\sqrt[3]{4^2}}{4} = 3\sqrt[3]{2 * 2^3} =$
$= 6\sqrt[3]{2}$

13. $\frac{3}{10+\sqrt{5}} = \frac{3}{10+\sqrt{5}} * \frac{10-\sqrt{5}}{10-\sqrt{5}} =$
$= \frac{3(10-\sqrt{5})}{10^2-(\sqrt{5})^2} =$
$= \frac{3(10-\sqrt{5})}{95}$

14. $\frac{y-x}{\sqrt{y}-\sqrt{x}} = \frac{y-x}{\sqrt{y}-\sqrt{x}} * \frac{\sqrt{y}+\sqrt{x}}{\sqrt{y}+\sqrt{x}} =$
$= \frac{(y-x)(1+\sqrt{x})}{(\sqrt{y})^2-(\sqrt{x})^2} =$
$= \frac{(y-x)(1+\sqrt{x})}{y-x} = 1+\sqrt{x}$

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Simplifying Radicals Assignment

Simplify radicals and recognize like or unlike radicals.

15. $2\sqrt{3}$; $3\sqrt{2}$;

UNLIKE RADICALS

16. $3\sqrt{6}$; $\sqrt{24}$

$3\sqrt{6}$; $\sqrt{2^2 * 6}$

$3\sqrt{6}$; $2\sqrt{6}$

LIKE RADICALS

17. $\sqrt[3]{250}$; $\sqrt[3]{54}$; $\sqrt[3]{16}$

$\sqrt[3]{2 * 5^3}$; $\sqrt[3]{2 * 3^3}$; $\sqrt[3]{2 * 2^3}$

$5\sqrt[3]{2}$; $3\sqrt[3]{2}$; $2\sqrt[3]{2}$

LIKE RADICALS

18. $\sqrt[4]{2a^4b^9}$; $6\sqrt[3]{2ab}$; $3\sqrt[4]{2ab^5}$

$\sqrt[4]{2a^4bb^4b^4}$; $6\sqrt[4]{2ab}$; $3\sqrt[4]{2abb^4}$

$ab^2\sqrt[4]{2b}$; $6\sqrt[4]{2ab}$; $3b\sqrt[4]{2ab}$

UNLIKE RADICALS

Simplify the following expressions.

19. $\left(\sqrt[5]{-32}\right)^2 = \sqrt[5]{(-2)^{5*2}} = \sqrt[5]{(-2)^{10}} =$

$= (-2)^2 = 4$

20. $\sqrt[5]{\sqrt{xy^3}} = \sqrt[5*2]{xy^3} = \sqrt[10]{xy^3}$