

Math Sheet

Name _____ Score _____ / 10 Teacher _____ Date _____

Simplify Radical Expressions

Extract perfect powers and retain real-domain conditions.

1. $\sqrt{4 \cdot x^2}$

Domain: real variables $x \in \mathbb{R}$

2. $\sqrt[3]{8 \cdot x^4}$

Domain: real variables $x \in \mathbb{R}$

3. $\sqrt{20}$

4. $\sqrt[3]{216 \cdot x^6}$

Domain: real variables $x \in \mathbb{R}$

5. $\sqrt{1 \cdot x^5}$

Domain: real variables $x \in \mathbb{R} \quad 1 \cdot x^5 \geq 0$

6. $\sqrt[3]{24}$

7. $\sqrt{1 \cdot x^6}$

Domain: real variables $x \in \mathbb{R}$

8. $\sqrt[3]{125 \cdot x^{10}}$

Domain: real variables $x \in \mathbb{R}$

9. $\sqrt{108}$

10. $\sqrt[3]{343 \cdot x^3}$

Domain: real variables $x \in \mathbb{R}$

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Simplify Radical Expressions

Answer Key

Extract perfect powers and retain real-domain conditions.

1. $\sqrt{4 \cdot x^2}$
Domain: real variables $x \in \mathbb{R}$
Work:
 $\sqrt{4 \cdot x^2} = 2|x|$

2. $\sqrt[3]{8 \cdot x^4}$
Domain: real variables $x \in \mathbb{R}$
Work:
 $\sqrt[3]{8 \cdot x^4} = 2 \cdot x \cdot \sqrt[3]{x}$

3. $\sqrt{20}$
Work:
 $\sqrt{20} = 2\sqrt{5}$

4. $\sqrt[3]{216 \cdot x^6}$
Domain: real variables $x \in \mathbb{R}$
Work:
 $\sqrt[3]{216 \cdot x^6} = 6 \cdot x^2$

5. $\sqrt{1 \cdot x^5}$
Domain: real variables $x \in \mathbb{R} \quad 1 \cdot x^5 \geq 0$
Work:
 $\sqrt{1 \cdot x^5} = 1 \cdot x^2 \cdot \sqrt{x}$

6. $\sqrt[3]{24}$
Work:
 $\sqrt[3]{24} = 2 \cdot \sqrt[3]{3}$

7. $\sqrt{1 \cdot x^6}$
Domain: real variables $x \in \mathbb{R}$
Work:
 $\sqrt{1 \cdot x^6} = |x^3|$

8. $\sqrt[3]{125 \cdot x^{10}}$
Domain: real variables $x \in \mathbb{R}$
Work:
 $\sqrt[3]{125 \cdot x^{10}} = 5 \cdot x^3 \cdot \sqrt[3]{x}$

9. $\sqrt{108}$
Work:
 $\sqrt{108} = 6\sqrt{3}$

10. $\sqrt[3]{343 \cdot x^3}$
Domain: real variables $x \in \mathbb{R}$
Work:
 $\sqrt[3]{343 \cdot x^3} = 7 \cdot x$