

WORK SHEET: SIMPLIFYING RADICALS



Assume all variables represent non-negative real numbers.

Examples:

$$\sqrt{4} + \sqrt{9} - \sqrt{36} = 2 + 3 - 6 = -1$$

$$\sqrt{4 + 9} = \sqrt{13}$$

$$\sqrt{50} - \sqrt{25 \cdot 2} = \sqrt{25} \cdot \sqrt{2} = 5\sqrt{2}$$

$$\sqrt{x^2 y^3} = \sqrt{x^2} \sqrt{y^3} = \sqrt{x^2} \sqrt{y^2} \sqrt{y} = xy\sqrt{y}$$

$$\sqrt{4x} + \sqrt{x} = \sqrt{4} \sqrt{x} + \sqrt{x} = 2\sqrt{x} + 1\sqrt{x} = 3\sqrt{x}$$

$$(3\sqrt{2})(4\sqrt{6}) = 12\sqrt{6 \cdot 2} = 12\sqrt{12} = 12\sqrt{4\sqrt{3}} = 12 \cdot 2\sqrt{3} = 24\sqrt{3}$$

Practice:

1. $\sqrt{81} - \sqrt{25} + \sqrt{100}$

2. $\sqrt{60} - \sqrt{30}$

3. $\frac{\sqrt{64}}{\sqrt{4}}$

4. $\sqrt{8x} - \sqrt{18x}$

5. $15\sqrt{xy^2} - 3y\sqrt{49x}$

6. $(2\sqrt{6})(3\sqrt{15})$

7. $(2 + \sqrt{6})(3 - \sqrt{15})$

8. $\sqrt{36 + 64}$

9. $\sqrt{36 + 9}$

10. $(\sqrt{9} + \sqrt{25})^2$

11. $(\sqrt{x^3} - \sqrt{y^3})^2$

Answers: 1. 14 2. $2\sqrt{15} - \sqrt{30}$ 3. 4 4. $-\sqrt{2x}$ 5. $-6y\sqrt{x}$ 6. $18\sqrt{10}$
 7. $6 - 2\sqrt{15} + 3\sqrt{6} - 3\sqrt{10}$ 8. 10 9. $\sqrt{45} - 3\sqrt{5}$ 10. 64 11. $x^3 - 2xy\sqrt{xy} + y^3$

Find simplified radical form and also find each of the following to the nearest tenth and graph each on a number line.

I Simplified Radical Form

II Nearest 10th

III Number Line

A $\sqrt{50}$

B $\sqrt{108}$

C $\sqrt{75}$

D $\sqrt{25}\sqrt{4}$

E $\sqrt{30}\sqrt{5}$

F $\sqrt{32}\sqrt{6}$

G $5\sqrt{12} - 2\sqrt{27}$

H $4\sqrt{3} - 3\sqrt{75}$

ANSWERS:

A) $5\sqrt{2}$, 7.1

B) $6\sqrt{3}$, 10.4

C) $5\sqrt{3}$, 8.7

D) 10, 10.0

E) $5\sqrt{6}$, 12.2

F) $8\sqrt{3}$, 13.9

G) $4\sqrt{3}$, 6.9

H) $-11\sqrt{3}$, -19.1