

January ~~12th~~ 14th

Due Today: HW 6.5

Due Next Class: HW 6.6

Unit 6: Exponents

Lesson 6.6 Simplifying Radicals



Get Ready: Check your homework

1) 10

2) $6\sqrt{2}$

3) $6\sqrt{5}$

4) $2\sqrt{6}$

5) $\frac{16}{9}$

6) $6\sqrt{6}$

7) $7\sqrt{3}$

8) $8\sqrt{2}$

9) $\sqrt{490}$

10) $\sqrt{80}$

11) $\sqrt{12}$

12) $\sqrt{28}$

13) $6\sqrt{5}$

14) 0

15) $-12\sqrt{5}$

16) $-6\sqrt{6}$

17) $-5\sqrt{3} + 6\sqrt{2}$

18) $8\sqrt{6} - \sqrt{2}$

19) $-3\sqrt{2} + 6\sqrt{6}$

20) $-3\sqrt{5}$



HW 6.5 Questions?

$$5) \sqrt{256}$$

$$= \sqrt{16} \cdot \sqrt{16}$$

$$= 4 \cdot 4$$

$$= 16$$

$$(\sqrt{16})^2$$

$$\begin{aligned} 19) & -3\sqrt{2} + 3\sqrt{54} - 3\sqrt{6} \\ & -3\sqrt{2} + 3\sqrt{9} \sqrt{6} - 3\sqrt{6} \\ & -3\sqrt{2} + 3 \cdot 3\sqrt{6} - 3\sqrt{6} \\ & -3\sqrt{2} + 9\sqrt{6} - 3\sqrt{6} \\ & -3\sqrt{2} + 6\sqrt{6} \end{aligned}$$

Simplifying Radicals

$$\sqrt{\text{Big \#}} = \sqrt{\text{Biggest Possible Square \#}} \cdot \sqrt{\text{Not Square \#}}$$

first! (with arrow pointing to the first square root)

second (with arrow pointing to the second square root)

$$\begin{aligned}\sqrt{32} &= \sqrt{16} \cdot \sqrt{2} \\ &= 4\sqrt{2}\end{aligned}$$

Multiplying & Dividing Radicals

$$\sqrt{9} * \sqrt{9} =$$

$$(\sqrt{9})^2 = 9$$

$$\sqrt{3} * \sqrt{15} =$$

$$\begin{aligned}\sqrt{45} &= \sqrt{9 \cdot 5} \\ &= \sqrt{9} \cdot \sqrt{5}\end{aligned}$$

Multiplying Radicals

$$3\sqrt{10} * -2\sqrt{5} =$$

$$-6\sqrt{50} = -6\sqrt{25 \cdot 2}$$

$$-6\sqrt{25} \cdot \sqrt{2}$$

$$-6 \cdot 5\sqrt{2}$$

$$-30\sqrt{2}$$

$$\cancel{12\sqrt{2} + 4\sqrt{2}} \\ = \cancel{16\sqrt{2}}$$

$$2\sqrt{8}(3 + 2\sqrt{6}) =$$

$$2 \cdot 3\sqrt{8} + 2\sqrt{8} \cdot 2\sqrt{6}$$

$$6\sqrt{8} + 4\sqrt{48}$$

$$6\sqrt{4} \cdot \sqrt{2} + 4\sqrt{16} \cdot \sqrt{3}$$

$$6 \cdot 2 \cdot \sqrt{2} + 4 \cdot 4\sqrt{3}$$

$$\boxed{12\sqrt{2} + 16\sqrt{3}}$$

$$12x + 4y$$

You try:

① $3\sqrt{3} * 1\sqrt{6} =$

② $-2\sqrt{5} * 3\sqrt{10} =$

$$\sqrt{9} = 3$$

You try:

$$\textcircled{1} \quad 3\sqrt{3} * \sqrt{6} =$$

$$= 3 \cdot \sqrt{18} = \sqrt{9 \cdot 2} =$$

$$= 3 \cdot \boxed{\sqrt{9}} \cdot \sqrt{2}$$

$$= 3 \cdot 3 \cdot \sqrt{2}$$

$$= \boxed{9\sqrt{2}}$$

$$\textcircled{2} \quad -2\sqrt{5} * 3\sqrt{10} =$$

$$= -6\sqrt{50}$$

$$= -6\sqrt{25} \cdot \sqrt{2}$$

$$= -6 \cdot 5 \cdot \sqrt{2}$$

$$= \boxed{-30\sqrt{2}}$$

Multiplying & **Dividing** Radicals

no radicals stay in denominator!

ex 1)

$$\frac{\sqrt{108}}{\sqrt{6}} = \frac{\sqrt{18}}{\sqrt{1}}$$

$$= \sqrt{18}$$

$$= \sqrt{9 \cdot 2} = \sqrt{9} \cdot \sqrt{2}$$

$$= 3\sqrt{2}$$

ex 2)

$$\frac{\sqrt{5}}{\sqrt{80}} = \frac{\sqrt{1}}{\sqrt{16}} = \frac{1}{4}$$

Dividing Radicals

$$\frac{7\sqrt{6}}{\sqrt{8}} = \frac{7\sqrt{3}}{\sqrt{4}}$$
$$= \frac{7\sqrt{3}}{2}$$

$$\frac{2\sqrt{5}}{3\sqrt{80}} = \frac{2\sqrt{1}}{3\sqrt{16}} = \frac{2 \cdot 1}{3 \cdot 4} = \frac{2}{12}$$
$$= \frac{1}{6}$$

You try:

$$\textcircled{3.} \quad \frac{3\sqrt{20}}{\sqrt{4}} =$$

$$\textcircled{4.} \quad -\frac{\sqrt{32}}{2\sqrt{8}} =$$

You try:

③.

$$\frac{3\sqrt{20}}{\sqrt{4}} = \frac{3\sqrt{5}}{\sqrt{1}}$$
$$= \boxed{3\sqrt{5}}$$

④.

$$-\frac{\sqrt{32}}{2\sqrt{8}} = -\frac{\sqrt{4}}{2\sqrt{1}}$$
$$= -\frac{2}{2 \cdot 1}$$
$$= \boxed{-1}$$

Practice: simplify as much as possible. Work with your table.

No questions answered by teacher in first 5 minutes



1) $-\sqrt{2} * -\sqrt{27}$

$$3\sqrt{6}$$

2) $\frac{\sqrt{2}}{\sqrt{32}} = \frac{1}{4}$

3) $\sqrt{6}(3 + \sqrt{3})$

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

4) $\frac{\sqrt{4}}{4\sqrt{25}} = \frac{1}{10}$

5) $3\sqrt{27} - \sqrt{3} = 8\sqrt{3}$

6) $-4\sqrt{20} * -2\sqrt{8}$

$20 \cdot 8 = 160$

$$32\sqrt{10}$$

7) $3\sqrt{3} * 2\sqrt{81} = 54\sqrt{3}$

8) $\frac{6\sqrt{3}(1 - \sqrt{5})}{\sqrt{27}}$ bonus
 $2 - 2\sqrt{5}$

Your Quizzes: modeling your scenario...

Recap

Key Points

Tonight's video: what to do when radicals remain in the denominator

Due Next Time:

VN 6.6
HW 6.6

Next Class: