Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Operations with Radicals

|  |  |  |  |
| --- | --- | --- | --- |
| **Adding/Subtracting** 1. Simplify each so they have the same radicand.
2. Add or subtract!
 | 1. 9$\sqrt{3}$ + 4$\sqrt{3}$
 | 1. $\sqrt{20}$ + 6$\sqrt{45}$
 | 1. $\sqrt{80}$ - $\sqrt{125}$
 |
| **Multiply Radials**Multiply real numbers with real numbers, radical numbers with radical number.SIMPLIFY! | 1. $\sqrt{8}$($\sqrt{12}$)
 | 1. 3$\sqrt{2}$(5$\sqrt{10)}$
 | 1. 4$\sqrt{6}$(2$\sqrt{3}$)
 |
| 1. $\sqrt{3}$(8 + $\sqrt{6}$)
 | 1. 2$\sqrt{5}$($\sqrt{5}$ + 4$\sqrt{2}$)
 | 1. 5$\sqrt{6}$(2$\sqrt{8}$ - 2$\sqrt{6}$)
 |
| **Dividing Radicals**1. **Divide or reduce first if possible!**
2. Simplify numerator and denominator
 | 1. $\sqrt{\frac{11}{49}}$
 | 1. $\sqrt{\frac{25p^{3}}{q^{2}}}$
 | 1. $\sqrt{\frac{75}{16x^{2}}}$
 |
| 1. $\sqrt{\frac{27x^{3}}{3x}}$
 | 1. $\sqrt{\frac{88}{11}}$
 | 1. $\sqrt{\frac{48}{75}}$
 |
| **Dividing Radicals by rationalizing the denominator****GOAL: no radicals left in the denominator**1. multiply numerator and denominator by the same radical to force a perfect square to occur in the denominator
2. simplify!!!
 | 1. $\frac{3}{\sqrt{3}}$
 | 1. $\frac{2}{\sqrt{6}}$
 | 1. $\frac{\sqrt{5}}{\sqrt{18x}}$
 |
| 1. $\sqrt{\frac{7m}{10}}$
 | 1. $\sqrt{\frac{3}{8x}}$
 | 1. $\sqrt{\frac{9}{20x}}$
 |

Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Algebra Operations with radicals ws

|  |  |  |  |
| --- | --- | --- | --- |
| 1. 8$\sqrt{2}$ - $\sqrt{2}$
 | 1. 6$\sqrt{5}$ + 12$\sqrt{5}$
 | 1. $\sqrt{48}$ + $\sqrt{27}$
 | 1. 20$\sqrt{12}$ - 2$\sqrt{75}$
 |
| 1. 2$\sqrt{7}$ - $\sqrt{28}$
 | 1. -4$\sqrt{10}$ + 6$\sqrt{40}$
 | 1. $\sqrt{8}$ + 2$\sqrt{2}$
 | 1. 2$\sqrt{12}$ - 7$\sqrt{3}$
 |
| 1. $\sqrt{3}$(5$\sqrt{3}$)
 | 1. 6$\sqrt{2}$(4$\sqrt{3}$)
 | 1. 8$\sqrt{6}$(6$\sqrt{8}$)
 | 1. 10$\sqrt{6}$(5$\sqrt{3}$)
 |
| 1. $\sqrt{2}$($\sqrt{8}$ - 5)
 | 1. $\sqrt{3}$($\sqrt{27}$ + 1)
 | 1. $\sqrt{6}$($\sqrt{6}$ – 4)
 | 1. $\sqrt{3}$($\sqrt{15}$ + 2$\sqrt{5})$
 |
| 1. $\sqrt{\frac{3}{4}}$
 | 1. $\sqrt{\frac{120}{121}}$
 | 1. $\sqrt{\frac{5}{9a^{4}}}$
 | 1. $\sqrt{\frac{8x^{3}}{81}}$
 |
| 1. $\sqrt{\frac{54}{24}}$
 | 1. $\sqrt{\frac{60}{5}}$
 | 1. $\sqrt{\frac{30x^{5}}{40x}}$
 | 1. $\sqrt{\frac{63y}{7y^{3}}}$
 |
| 1. $\frac{3}{\sqrt{2}}$
 | 1. $\frac{5}{\sqrt{15}}$
 | 1. $\frac{\sqrt{3}}{\sqrt{7x}}$
 | 1. $\frac{9}{\sqrt{8}}$
 |
| 1. $\frac{12}{\sqrt{12}}$
 | 1. $\frac{3\sqrt{2}}{\sqrt{9b}}$
 | 1. $\frac{4}{\sqrt{2x}}$
 | 1. $\frac{12}{\sqrt{6x}}$
 |