

Radical Expressions Review

1. $\sqrt{1.69}$

1.3

2. $\sqrt{-2.56}$

not
possible

3. $\sqrt[4]{81x^{20}y^8}$

 $3x^5y^2$

4. $\sqrt[3]{27x^{15}y^{24}}$

$$3x^5y^8$$

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

$$\sqrt{12}$$
$$\sqrt{4}\sqrt{3}$$
$$2\sqrt{3}$$

6. $\sqrt[4]{11} \cdot \sqrt[4]{3}$

$$\sqrt[4]{33}$$

7. $\sqrt[3]{108a^{16}b^9}$

~~$\sqrt[3]{27} \sqrt[3]{4}$~~
 ~~$\sqrt[3]{a^5} \sqrt[3]{a} \sqrt[3]{b^9}$~~

$3a^5 b^3 \sqrt[3]{4a}$

8. $\sqrt[3]{7x^7} \cdot \sqrt[3]{9x^4}$

$\sqrt[3]{63x^{11}}$

~~$\sqrt[3]{63} \sqrt[3]{x^9} \sqrt[3]{x^2}$~~

$x^3 \sqrt[3]{63x^2}$

9. $\sqrt{50x^7y^7} \cdot \sqrt{6xy^4}$

$\sqrt{300x^8y^{11}}$

~~$\sqrt{100} \sqrt{3} \sqrt{x^8} \sqrt{y^{10}}$~~

$10x^4 y^5 \sqrt{3y}$

10. $\frac{\sqrt[3]{270x^{20}}}{\sqrt[3]{5x}} =$

$\sqrt[3]{\frac{270x^{20}}{5x}} = \sqrt[3]{54x^{19}}$

~~$\sqrt[3]{27} \cdot \sqrt[3]{2} \sqrt[3]{x^{18}} \sqrt[3]{x}$~~ = $\boxed{3x^6 \sqrt[3]{2x}}$

11. $\frac{\sqrt{90x^{18}}}{\sqrt{2x}}$ $\sqrt{\frac{90x^{18}}{2x}} = \sqrt{45x^{17}}$
 $\frac{\sqrt{9}\sqrt{5}\sqrt{x^{16}}\sqrt{x}}{3x^8\sqrt{5x}}$

12. $\frac{\sqrt[3]{9}}{\sqrt[3]{11}}$ $\frac{\sqrt[3]{9} \cdot \sqrt[3]{11^2}}{\sqrt[3]{11} \cdot \sqrt[3]{11^2}} = \frac{\sqrt[3]{9 \cdot 11^2}}{\sqrt[3]{11^3}} = \frac{\sqrt[3]{1089}}{11}$

$\sqrt[3]{9 \cdot 11^2} = \sqrt[3]{9 \cdot 121}$

13. $\frac{\sqrt{6x^8y^9}}{\sqrt{5x^2y^4}} \cdot \frac{\sqrt{5x^2y^4}}{\sqrt{5x^2y^4}} = \frac{\sqrt{30x^{10}y^{13}}}{5x^2y^4}$ $\frac{x^3y^2 \sqrt{30y}}{x^2y^4 \sqrt{30y}}$
 $\frac{\sqrt{30} \sqrt{x^{10}} \sqrt{y^{12}} \sqrt{y}}{5x^2y^4} = \frac{5x^2y^4 \sqrt{30y}}{5x^2y^4 \sqrt{30y}}$

14. $2^4\sqrt{2x} + 6^4\sqrt{2x}$

$$8^4\sqrt{2x}$$

15. $4^3\sqrt{3x} + 5^3\sqrt{10x}$

$$4^3\sqrt{3x} + 5^3\sqrt{10x}$$

16. $3\sqrt{2a} - 6\sqrt{2a}$

$$-3\sqrt{2a}$$

17. $(7 - \sqrt{2})(8 + \sqrt{2})$

$56 + 7\sqrt{2} - 8\sqrt{2} - 2$
 $54 - \sqrt{2}$

18. $(-5 - \sqrt{3})^2$

$(-5)^2 - (-5)(\sqrt{3})(2) + (\sqrt{3})^2$
 $25 - (-10\sqrt{3}) + 3$
 $28 + 10\sqrt{3}$

19. $(\sqrt{2} + \sqrt{10})(\sqrt{2} - \sqrt{10})$

$2 - 10 = -8$

$2\sqrt{18}$
 $2\sqrt{9}\sqrt{2}$
 $2(3)\sqrt{2}$
 $6\sqrt{2}$

$\frac{9 - 2\sqrt{18}}{-3}$

20. $\left(\frac{\sqrt{3} - \sqrt{6}}{\sqrt{3} + \sqrt{6}}\right) (\sqrt{3} - \sqrt{6})$
 $\left(\frac{\sqrt{3} - \sqrt{6}}{\sqrt{3} + \sqrt{6}}\right) (\sqrt{3} - \sqrt{6})$

$\frac{3 - \sqrt{18} - \sqrt{18} + 6}{3 - 6}$

$\frac{9 - 6\sqrt{2}}{-3} \div -3 = \boxed{-3 + 2\sqrt{2}}$

