

Work on as many problems as you can together with your group members. Towards the end of lecture your group will be asked to present a problem correctly to receive classwork points.

1. Evaluate each exponential expression.

(a) $6^2 \cdot 2^4$

(b) -3^3

(c) $(-5)^2$

(d) 6^0

(e) 2^{-5}

(f) $2^2 \cdot 2^5$

(g) $7^2 \cdot 7^{-3}$

(h) $\frac{3^4}{3^7}$

2. Simplify each exponential expression.

(a) $x^{-3}y$

(b) $x^3 \cdot x^2$

(c) $x^{-4}y$

(d) $\frac{x^{36}}{x^{29}}$

(e) $(3x)^3$

(f) $(8x^3)^2$

(g) $\left(-\frac{2}{x}\right)^2$

3. Simplify each exponential expression.

(a) $(-6x^3y)(-2x^5y^2)$

(b) $\left(\frac{x^{-2}y^8}{x^{-4}y^{12}}\right)^{-2}$

(c) $\left(\frac{-10a^{13}b^6}{30a^{18}b^{-3}}\right)^2$

(d) $\left(\frac{30x^{26}y^{45}}{41x^{-32}y}\right)^0$

4. Evaluate each expression, or indicate that the root is not a real number.

(a) $\sqrt{25} - \sqrt{4}$

(b) $\sqrt{25 - 4}$

(c) $\sqrt{(-6)^2}$

(d) $\sqrt{-25}$

5. Use the product rule to simplify each expression.

(a) $\sqrt{45x^3}$

(b) $\sqrt{3x^2} \cdot \sqrt{6x}$

(c) $\sqrt{125y^2x} \cdot 10x^2$

6. Use the quotient rule to simplify the expressions. Assume $x > 0$.

(a) $\frac{\sqrt{3x^3}}{\sqrt{48x}}$

(b) $\frac{\sqrt{24x^4}}{\sqrt{4x^2}}$

(c) $\sqrt{\frac{121}{9}}$

7. Add or subtract terms whenever possible.

(a) $6\sqrt{3} - 14\sqrt{3}$

(b) $3\sqrt{5x} + 2\sqrt{5x} - 4\sqrt{5}$

(c) $2\sqrt{54} - 3\sqrt{24} + \sqrt{96} - 5\sqrt{63}$

8. Rationalize the denominator.

(a) $\frac{1}{\sqrt{7}}$

(b) $\frac{\sqrt{3}}{\sqrt{5}}$

(c) $\frac{3}{3 + \sqrt{5}}$

9. Evaluate each expression.

(a) $8^{1/3}$

(b) $16^{-5/2}$

(c) $125^{2/3}$

10. Simplify the following expressions.

(a) $(7x^{1/3})(2x^{1/5})$

(b) $(y^{1/3})^6$

(c) $\frac{(2x^{1/4})^5}{x^{3/8}}$

(d) $\sqrt[3]{9} \cdot \sqrt[3]{6}$

(e) $\frac{\sqrt[5]{64x^6}}{\sqrt[5]{2x}}$

(f) $\sqrt[3]{x^5}$