

1. Completely simplify the following. Assume that the variables may be either positive or negative.

(a) $\sqrt{100x^2}$

(b) $\sqrt{x^2 + 8x + 16}$

2. Completely simplify the following. You do not need to use any absolute values.

(a) $\sqrt{18x^3y^8}$

(b) $\sqrt[3]{16x^3y}$

3. Find the domain of the following functions.

(a) $f(x) = \sqrt{5-x}$

(b) $f(x) = \sqrt[3]{x-4}$

4. Simplify the following. The final answers should be written using only positive exponents, not radical signs.

(a) $\frac{\sqrt{xy^3}}{\sqrt[3]{xy}}$

(b) $(27x^3y^{-2/3})^{-1/3}$

5. Rationalize the denominator.

(a) $\frac{2}{1 + \sqrt{3}}$

(b) $\frac{2}{\sqrt[3]{3x^4y^2}}$

6. Simplify the following. You do not need to use any absolute values.

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

(b) $5\sqrt{12x^3} - 3x\sqrt{3x} + 5\sqrt{x}$

7. Simplify the following.

(a) $(3 - 2i)^2$

(b) $\frac{3 - 2i}{3 + 4i}$

8. Find the midpoint of the line segment connecting $(\frac{2}{3}, \frac{1}{2})$ and $(\frac{-1}{3}, \frac{1}{6})$.

9. During the summer heat, a 2000 meter bridge expands by 1 meter, with the bulge occurring in the middle. How high is the bulge?

10. The sides of an equilateral triangle are 8 feet. What is the area of the triangle?

11. The distance from the point (3,4) to the point (x,12) is 10. Find all possible values of x.

12. Solve $\sqrt{2x-1} + \sqrt{x+3} = 3$