

Do *not* assume that variables represent positive real numbers, but *do* assume that every expression represents a real number. So if you see a $\sqrt{x^{\text{odd power}}}$, you assume $x \geq 0$. If you see a $\sqrt{x^{\text{even power}}}$, you can *not* assume that $x \geq 0$. The *next* level of understanding is that $|x^{\text{even power}}| = |x|^{\text{even power}} = x^{\text{even power}}$, but even though $|x^{\text{odd power}}| = |x|^{\text{odd power}}$ is true, you can't get rid of the absolute value that easily.

1. **7.1** Simplify each radical expression. Rationalize denominators in final step (This is technically a 7.5 skill...).

a. $\sqrt{81x^2y^6z^8}$

b. $\sqrt{\frac{27x^3}{25y}}$

2. **7.1** Identify the domain and graph $f(x) = \sqrt{x+2} - 3$

3. **7.2** Simplify the expression.

a. $\frac{(x^{-2}y^3)^{1/8}}{(x^{-3}y)^{-1/4}}$

b. $\left(\frac{x^{-2}y^3}{x^{-3}y}\right)^{1/8}$

4. **7.2** Multiply $(3x^{1/2} - 2)(3x^{1/2} + 2)$
5. **7.2** Use rational *exponents* to write the product $\sqrt[5]{x}\sqrt[3]{5y}$ as a single rational expression. This is like #2 85 – 98 in **7.2**, but they gave imprecise instructions.
6. **7.3** Simplify. Assume all expressions represent real numbers. (Variables may or may not be nonnegative.)
- a. $\sqrt{8x^2y^3}$
- b. $\frac{\sqrt[5]{64x^{10}y^3}}{\sqrt[5]{2x^3y^{-7}}}$
7. **7.3** Find the distance between the two points $(3, 2)$, $(-2, -3)$. Leave your result in simplified radical form.
8. **7.4** Under the conventions we are following, 7.4 #s 39 and 40 are a lot harder than they look. Ask me about ‘em. In the meantime, add $\frac{\sqrt[3]{x^5}}{8} + \frac{5x\sqrt[3]{x^2}}{4}$
9. **7.4** Multiply and simplify $(5\sqrt{7x} - \sqrt{2x})(4\sqrt{7x} + 6\sqrt{2x})$

10. **7.5** Rationalize...

a. ... the denominator of $\frac{2}{1-\sqrt{3}}$

b. ... the numerator of $\frac{2+\sqrt{7}}{5-\sqrt{3}}$

11. **7.6** Solve the radical equations

a. $\sqrt{7x-5} = \sqrt{4x+3}$

b. $x - \sqrt{x-2} = 4$

c. $\sqrt{x+1} - \sqrt{x-1} = 2$

12. The following equations are quadratic in form. Solve them.

a. $x - 2\sqrt{x} - 8 = 0$

b. $x^4 - 2x^2 - 8 = 0$

c. $x^{-2} - 2x^{-1} - 8 = 0$