

**PDEV 100**  
**Exam 4**  
**Review Sheet**

This review sheet is intended to remind you of the concepts that you are expected to understand for the exam. It is by no means a complete representation of what could be on the exam. You are responsible for everything discussed in the notes, on labs and in the suggested homework exercises. You should work these on a separate piece of paper.

1. Simplify the following. Assume all variables represent nonnegative numbers.

(a)  $-\sqrt{16}$

(d)  $27^{2/3}$

(h)  $\sqrt[3]{125}$

(b)  $\sqrt[3]{-\frac{27}{8}}$

(e)  $\sqrt{32x^3y^4}$

(i)  $\sqrt[4]{81x^7y^5}$

(c)  $49^{-1/2}$

(f)  $\sqrt[3]{54a^7b^8c^11}$

(j)  $\sqrt{28a^5b^8}$

(g)  $\sqrt{-64}$

2. Simplify the following. Do not assume that variables are positive.

(a)  $\sqrt{9x^2y^4}$

(b)  $\sqrt{x^2 - 18x + 81}$

(c)  $\sqrt{4x^2 + 20x + 25}$

3. Simplify. Do not leave negative exponents in your answers.

(a)  $\frac{(4x^2y^4)^{1/2}}{(8x^6y^9)^{2/3}}$

(c)  $(x^{3/4})^{2/3} \cdot x^{1/2}$

(b)  $\frac{(x^{-1/2}y^2)^4}{x^2y^5}$

(d)  $\frac{2a^{-1/2}b^{2/3}}{3a^{3/2}b^{-7/3}}$

4. Rationalize the denominator.

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

(c)  $\frac{4}{\sqrt[3]{2y}}$

(e)  $\frac{6}{\sqrt{3}+\sqrt{2}}$

(b)  $\frac{2}{3-\sqrt{2}}$

(d)  $\frac{x}{\sqrt[3]{9x}}$

(f)  $\frac{5}{2-\sqrt{7}}$

5. Perform the following operations and simplify your answers.

(a)  $x^{1/5}(x^{4/5} + x^{9/5})$

(e)  $(x^{5/2} - 1)(x^{5/2} + 1)$

(b)  $3x^{3/2} - \frac{2x^2}{5x^{(1/2)}}$

(f)  $\sqrt{8} - \sqrt{2} + \sqrt{50}$

(c)  $(x^{2/3} - 3)(x^{2/3} + 1)$

(g)  $\sqrt{\frac{2}{3}} + \sqrt{\frac{3}{2}}$

(d)  $(x^{1/2} - 2y^{1/2})^2$

(h)  $\sqrt{8x^3} - 5x\sqrt{2x} + \sqrt{32x^3}$

6. Solve the following equations. Be sure to check your answers.

(a)  $\sqrt{2x+3} = x$

(d)  $x = 4 + \sqrt{12x - 84}$

(b)  $2 + \sqrt{x-2} = x$

(e)  $\sqrt{3x+7} = 1 + \sqrt{3x}$

(c)  $\sqrt{2x+5} = x+3$

(f)  $\sqrt{x-1} + \sqrt{x} = 1$

7. Solve by Completing the Square

(a)  $x^2 + 6x = 5$

(b)  $x^2 - 10x + 22 = 0$

(c)  $3x^2 - 2x - 3 = 0$

(d)  $2x^2 - 5 = 3x$

(e)  $x^2 + 5x + 1 = 0$

(f)  $x^2 - 10x + 21 = 0$

8. Solve using the Quadratic Formula.

(a)  $2x^2 + 5x = 8$

(b)  $9x^2 + 25 = 30x$

(c)  $4x^2 = 6x + 5$

(d)  $3x^2 + 10x + 4 = 2x + 3$

(e)  $2x^2 - 7x + 6 = 0$

(f)  $x^2 - 4x = -4$