

Math 94
Fall 2006
Exam 4 Practice

Find any values for which the following expressions are undefined.

1. $\frac{x^2 + 3}{x^2 + 3x + 2}$

2. $\frac{3x-6}{x^2-25}$

Reduce the following expressions.

3. $\frac{x^2 - 4}{x^2 - 6x + 8}$

4. $\frac{1 - x^2}{x^2 - 5x - 6}$

Perform the indicated operations. Express your answer in reduced form.

5. $\frac{2m + 1}{m^2 - 1} \div \frac{m^2 - 4m + 4}{m - 2}$ 6. $\frac{2x^2 + 11x - 21}{2x^2 - 7x - 49} \cdot \frac{6x^2 - 13x - 5}{6x^2 - 7x - 3}$

7. $\frac{12k^2 + 5k - 2}{3k^2 - k - 2} \div \frac{20k^2 + 3k - 2}{10k^2 - 6k - 4}$ 8. $\frac{4 - x^2}{x - 2} \cdot \frac{x + 3}{x^2 + 5x + 6}$

Simplify each of the following radicals.

9. $-\sqrt{-9}$

10. $\sqrt{63x^3y^6}$

11. $\frac{\sqrt{54x^2y^3}}{\sqrt{12xy}}$

12. $\sqrt{12x} \cdot \sqrt{20x^3y}$

13. $\frac{30\sqrt{10}}{5\sqrt{2}}$

Solve each radical equation.

14. $\sqrt{y + 2} = 5$

15. $\sqrt{5x - 1} + 3 = 0$

16. $6\sqrt{p} = \sqrt{30p + 24}$

17. $\sqrt{50 + 7k} = k + 8$

18. $\sqrt{p^2 + 12p - 4} + 4 = p$

19. $\sqrt{k} + 12 = k$

Perform the indicated operations and completely simplify each of the following expressions. Assume all variables represent nonnegative real numbers.

20. $\sqrt{\frac{3}{5}} \cdot \sqrt{\frac{3}{45}}$

21. $(4 - 2\sqrt{5})^2$

22. $\sqrt{\frac{21x^3y^4}{7x}}$

23. $\sqrt{\frac{1}{8x}} \cdot \sqrt{\frac{2}{25x^3}}$

24. $(\sqrt{7} + 2\sqrt{5})(\sqrt{35} - \sqrt{5})$

25. $\frac{\sqrt{6}}{2\sqrt{3} + 5}$

26. $(2 + \sqrt{7})(2 - \sqrt{7})$

27. $\frac{\sqrt{5} - 2}{4 - \sqrt{15}}$

28. Reduce to lowest terms: $\frac{15 + 10\sqrt{6}}{15}$

29. $3\sqrt{27x^2} - 5\sqrt{48x^2}$

30. $2\sqrt{3} + 4\sqrt{28} - 3\sqrt{63}$

31. $\frac{\sqrt{64y^3}}{\sqrt{72x^5}}$

32. $\sqrt[3]{108}$

33. $\sqrt[4]{405}$

34. $\sqrt[4]{\frac{8}{81}}$

35. Two sides of a right triangle are given. Approximate the length of the missing side to the nearest hundredth. Assume c represents the hypotenuse.

(a) $a = 7, b = 13$

(b) $b = 5, c = 8$

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Solutions

1. $x = -2, x = -1$

3. $\frac{x+2}{x-4}$

4. $\frac{1-x}{x-6}$

6. $\frac{(x+7)(2x-5)}{(2x+7)(x-7)}$

8. -1

10. $3xy^3\sqrt{7x}$

12. $4x^2\sqrt{15y}$

14. $y = 23$

16. $p = 4$

18. $p = -1$

20. $\frac{1}{5}$

21. $36 - 32\sqrt{5}$

23. $\frac{1}{10x^2}$

25. $\frac{6\sqrt{2} - 5\sqrt{6}}{-13}$

27. $4\sqrt{5} - 8 + 5\sqrt{3} - 2\sqrt{15}$

29. $-11x\sqrt{3}$

31. $\frac{2y\sqrt{2xy}}{3x^3}$

33. $3\sqrt[4]{5}$

35. (a) $c = \sqrt{218} \approx 14.76$

(b) $a = \sqrt{39} \approx 6.24$

2. $x = 5, x = -5$

5. $\frac{2m+1}{(m-1)(m+1)(m-2)}$

7. $\frac{2(4k-1)(k+1)}{(k-1)(4k+1)}$

9. non-real number

11. $\frac{3y\sqrt{2x}}{2}$

13. $6\sqrt{5}$

15. No real solutions.

17. $k = -2, k = -7$

19. $k = 16$ ($k = 9$ is extraneous)

22. $xy^2\sqrt{3}$

24. $7\sqrt{5} - \sqrt{35} + 10\sqrt{7} - 10$

26. -3

28. $\frac{3+2\sqrt{6}}{3}$

30. $2\sqrt{3} - \sqrt{7}$

32. $3\sqrt[3]{4}$

34. $\frac{\sqrt[4]{8}}{3}$