NCLS Math 7 Lesson 5 3/11/2012 Name: _____

15. $\frac{7x}{12x + x^2}$ **16.** $\frac{x + 2x^2}{x + 2}$ **17.** $\frac{12 - 5x}{10x^2 - 24x}$

18. $\frac{x^2 + 25}{2x + 10}$ **19.** $\frac{5 - x}{x^2 - 8x + 15}$ **20.** $\frac{2x^2 + 11x - 6}{x + 6}$

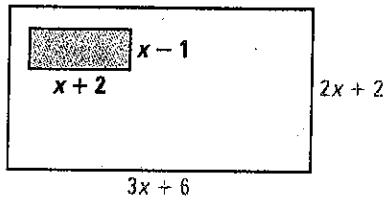
21. $\frac{x^2 + x - 20}{x^2 + 2x - 15}$ **22.** $\frac{x^3 + 9x^2 + 14x}{x^2 - 4}$ **23.** $\frac{x^3 - x}{x^3 + 5x^2 - 6x}$

UNDEFINED VALUES For what values of the variable is the rational expression undefined?

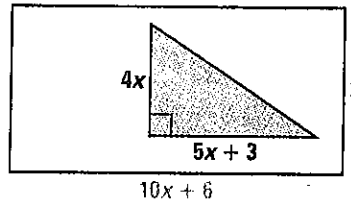
24. $\frac{7}{x - 3}$ **25.** $\frac{11}{x - 8}$ **26.** $\frac{4}{x^2 - 1}$

GEOMETRIC PROBABILITY A coin is tossed onto the large rectangular region shown. It is equally likely to land on any point in the region. Write a model that gives the probability that the coin will land in the red region. Then evaluate the model when $x = 3$.

30.

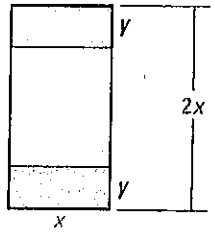


31.



CARNIVAL GAMES In Exercises 32–34, use the following information.

You are designing a game for a school carnival. Players will drop a coin into a basin of water, trying to hit a target on the bottom. The water is kept moving randomly, so the coin is equally likely to land anywhere. You use a rectangular basin twice as long as it is wide. You place the blue rectangular target an equal distance from each end.



32. Express the two dimensions of the target in terms of the variables x and y.

33. Write a model that gives the probability that the coin will land on the target.

34. CRITICAL THINKING You want players to win about half the time. Give a set of values you could use for x and y if the basin's area is between 72 and 120 square inches.

24. $\frac{2(x + 2)}{5(x - 3)} \div \frac{4(x - 2)}{5x - 15}$ **25.** $\frac{x^2 - 36}{-5x^2} \div (x - 6)$ **26.** $\frac{8}{2 + 3x} \cdot (8 + 12x)$

27. $\frac{3x}{x^2 - 2x - 24} \cdot \frac{x - 6}{6x^2 + 9x}$ **28.** $\frac{x}{3x^2 + 2x - 8} \cdot (3x - 4)$

29. $\frac{x + 1}{x^3(3 - x)} \div \frac{5}{x(x - 3)}$ **30.** $(4x^2 + x - 3) \cdot \frac{1}{(4x + 3)(x - 1)}$

31. $\frac{x^2 - 8x + 15}{x^2 - 3x} \div (3x - 15)$ **32.** $\frac{6x^2 + 7x - 33}{x + 4} \div (6x - 11)$

22. $\frac{2x}{x - 1} - \frac{7x}{x + 4}$ **23.** $\frac{x}{x - 10} + \frac{x + 4}{x + 6}$ **24.** $\frac{4x}{5x - 2} - \frac{2x}{5x + 1}$

25. $\frac{x + 8}{3x - 1} + \frac{x + 3}{x + 1}$ **26.** $\frac{3x + 10}{7x - 4} - \frac{x}{4x + 3}$ **27.** $\frac{2x + 1}{3x - 1} - \frac{x + 4}{x - 2}$

28. $\frac{x}{x^2 + 5x - 24} + \frac{8}{x^2 + 5x - 24}$ **29.** $\frac{x^2 + 1}{x^2 - 4} + \frac{5x}{x^2 - 4} - \frac{2x + 11}{x^2 - 4}$

30. $\frac{x^2 - 9}{x + 3} + \frac{x^2 + 9}{x - 3}$ **31.** $\frac{2}{x + 1} + \frac{3}{x - 2} + \frac{3}{x + 4}$

TRAVEL BY BOAT In Exercises 36–38, use the following information.

A boat moves through still water at x kilometers (km) per hour. It travels 24 km upstream against a current of 2 km per hour and then returns with the current. The rate upstream is $x - 2$ because the boat moves against the current, and the rate downstream is $x + 2$ because the boat moves with the current.

36. Write an expression for the total time for the round trip.

37. Write your answer to Exercise 36 as a single rational expression.

38. Use your answer to Exercise 37 to find how long the round trip will take if the boat travels 10 kilometers per hour through still water.