

Show all work on this test or on separate paper.

Turn in all worksheets. **CIRCLE** ANSWERS.

Reduce all fractions completely.

$$1. \frac{x^2 - 9}{9x - 27}$$

$$2. \frac{x^2 - 16}{x^2 - 8x + 16}$$

$$3. \frac{x + 3}{x^2 - 6x - 27}$$

$$4. \frac{5x^2 - 20x}{8 - 2x}$$

$$5. \frac{x^2 - 49}{x^2 + 12x + 35} \cdot \frac{x^2 - 3x - 10}{x^2 - 5x - 14}$$

$$6. \frac{9x^2y}{6xy + 12x} \div \frac{12y^2}{y^2 - 4}$$

In 7-9, find the LCD ONLY:

$$7. \frac{1}{27} > \frac{1}{12}$$

$$8. \frac{1}{6xy} > \frac{1}{12x^3y}$$

$$9. \frac{1}{x^2 - 25} > \frac{1}{x^2 + 10x + 25}$$

In 10-15, add or subtract:

$$10. \frac{y^2}{y+4} + \frac{4y}{y+4}$$

$$11. \frac{y^2+16}{y^2-16} - \frac{8y}{y^2-16}$$

$$12. \frac{3}{5x^2} + \frac{2}{25x}$$

$$13. \frac{4}{9x} - \frac{5}{3y}$$

$$14. \frac{2x}{x^2-4} - \frac{3}{x^2+x-6}$$

$$15. \frac{x-3}{x^2+5x+6} - \frac{1}{x+3}$$

In 16-21, solve for x:

$$16. \frac{4}{x} = \frac{8}{x-2}$$

$$17. \frac{4}{x+2} = \frac{12}{x+2}$$

$$18. \frac{4}{x} = \frac{x-2}{2}$$

19. $\frac{3(x - 2)}{4} - \frac{x}{2} = 2$

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

In 21-23, calculate. Round to the nearest hundredth. SHOW WORK!

21. If 6 ounces of peanut butter cost \$1.29, how much should you pay for 20 ounces?

22. If it takes 3 hours to drive 45 miles, how long will it take to drive 200 miles at this rate?

23. A salt water mixture calls for 3 pounds of salt per 100 gallons of water. How many gallons of water should be mixed with 70 pounds of salt?

In 24 - 25, solve for x:

24. $ax + b = c$

25. $ax = bx + c$

BASIC ALGEBRA EXAM 5 SR SOLUTIONS

1. $\frac{x^2-9}{9x-27} = \frac{(x-3)(x+3)}{9(x-3)} = \frac{x+3}{9}$
 2. $\frac{x^2-16}{x^2-8x+16} = \frac{(x-4)(x+4)}{(x-4)(x-4)} = \frac{x+4}{x-4}$
 3. $\frac{x+3}{x^2-6x-27} = \frac{x+3}{(x-9)(x+3)} = \frac{1}{x-9}$

4. $\frac{5x^2-20x}{8-2x} = \frac{5x(x-4)}{2(4-x)} = \frac{-5x}{2}$
 5. $\frac{(x-7)(x+7)}{(x+5)(x+2)} \cdot \frac{(x-5)(x+2)}{(x-7)(x+2)} = \frac{x-5}{x+5}$
 6. $\frac{9x^2y}{6x(y+2)} = \frac{12y^2}{(y-2)(y+2)}$
 $= \frac{3x^2y}{2(y+2)} \cdot \frac{(y-2)(y+2)}{y^2-4} = \frac{x(y-2)}{8y}$

7. $\frac{1}{27} > \frac{1}{12}$ LCD = $2^2 \cdot 3^3 = 108$
 8. $\frac{1}{6xy} > \frac{1}{12x^3y}$ LCD = $12x^3y$
 9. $\frac{1}{(x-5)(x+5)} \cdot \frac{1}{(x+5)^2}$ LCD = $(x-5)(x+5)^2$

10. $\frac{y^2}{y+4} + \frac{4y}{y+4} = \frac{y^2+4y}{y+4} = \frac{y(y+4)}{(y+4)} = y$
 11. $\frac{y^2+16}{y^2-16} - \frac{8y}{y^2-16} = \frac{y^2-8y+16}{y^2-16} = \frac{(y-4)(y-4)}{(y-4)(y+4)} = \frac{y-4}{y+4}$
 12. $\frac{3}{5x^2} + \frac{2}{25x} = \frac{3(5)}{5x^2(5)} + \frac{2(x)}{25x(x)} = \frac{15+2x}{25x^2}$
 13. $\frac{4}{9x} - \frac{5}{3y} = \frac{4(y)}{9x(y)} - \frac{5(3x)}{3y(3x)} = \frac{4y-15x}{9xy}$

14. $\frac{2x}{(x-2)(x+2)} - \frac{3}{(x+3)(x-2)}$
 $= \frac{2x(x+3)}{(x-2)(x+2)(x+3)} - \frac{3(x+2)}{(x+3)(x-2)(x+2)}$
 $= \frac{2x^2+6x-3x-6}{(x-2)(x+2)(x+3)} = \frac{2x^2+3x-6}{(x-2)(x+2)(x+3)}$
 15. $\frac{x-3}{(x+3)(x+2)} - \frac{1}{(x+3)(x+2)}$
 $= \frac{x-3-x-2}{(x+3)(x+2)} = \frac{-5}{(x+3)(x+2)}$
 16. $\frac{4}{x} = \frac{8}{x-2}$
 $x \neq 0$
 $x \neq 2$
 $4x-8 = 8x$
 $-8 = 4x$
 $x = -2$

17. $\frac{4}{x+2} = \frac{12}{x+2}$
 $x \neq -2$
 $4x+8 = 12x+24$
 $-8x = 16$
 $x = -2$
 Reject $x = -2$
 No Solution
 18. $\frac{4}{x} = \frac{x-2}{2}$
 $x^2-2x = 8$
 $x^2-2x-8 = 0$
 $(x-4)(x+2) = 0$
 $x = 4 \quad x = -2$
 19. $\frac{3(x-2)}{x} - \frac{x}{2} = 2$
 $3x-6-2x = 8$
 $x = 14$
 20. $\frac{x+2}{2} - \frac{x^2}{8} = 1.6$
 $3x+6-2x^2 = 6$
 $-2x^2+3x = 0$
 $x(3-2x) = 0$
 $x = 0 \quad x = 1.5$
 $x = \frac{3}{2}$
 21. $\frac{6}{1.29} = \frac{20}{x}$
 $6x = 20(1.29)$
 $x = \frac{25.8}{6} = 4.29$

22. $\frac{3hr}{45mi} = \frac{x}{200}$
 $45x = 3 \cdot 200$
 $x = \frac{600}{45} = 13.33hr$
 23. $\frac{300}{100hr} = \frac{7000}{x}$
 $3x = 7000$
 $x = \frac{7000}{3} = 2333.33hr$
 24. $ax+b=c$
 $ax = c-b$
 $x = \frac{c-b}{a}$
 25. $ax = bx+c$
 $-bx+ax = c$
 $x(a-b) = c$
 $x = \frac{c}{a-b}$