

Show all work on this test or on separate paper for partial credit.

Turn in all work sheets.

CALCULATORS.

CIRCLE ANSWERS

In 1-3, simplify the fractions to lowest terms:

$$1. \frac{x^2 - 16}{4x + 16}$$

$$2. \frac{6x^2y^3}{9x^4y^2}$$

$$3. \frac{m-5}{5-m}$$

In 4-5, find the product or quotient. Reduce to lowest terms:

$$4. \frac{x^2 - 5x + 6}{x^2 + 5x + 6} \cdot \frac{x^2 - 2x - 15}{x^2 - 8x + 15}$$

$$5. \frac{a^2 + a - 2}{a^4 - a^3} \div \frac{a^2 - 3a + 2}{a^3 - 2a^2}$$

In 6-10, find the least common denominator (LCD) only.

$$6. \frac{1}{8} > \frac{1}{12}$$

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

$$8. \frac{1}{12x^3y^4} > \frac{1}{20x^4y^2}$$

$$9. \frac{3}{x^2 + x - 6} > \frac{2}{x^2 + 4x + 3}$$

$$10. \frac{1}{x^2 + 5x + 6} > \frac{1}{x^2 + 4x + 4}$$

In 11-17, add or subtract as indicated.  
Reduce to lowest terms.

NAME \_\_\_\_\_

$$11. \frac{y^2}{y+4} + \frac{4y}{y+4}$$

$$12. \frac{3x^2-4x}{x^2-4} - \frac{2x^2-3x+6}{x^2-4}$$

$$13. \frac{5}{4x^2} + \frac{2}{3x}$$

$$14. \frac{7}{x} - \frac{5}{x-3}$$

$$15. \frac{7}{t^2-3t} + \frac{-4}{t-3}$$

$$16. \frac{6}{k^2+3k} - \frac{1}{k^2-k} + \frac{2}{k^2+2k-3}$$

$$17. \frac{x}{x^2+4x+3} - \frac{4}{x^2-3x-4}$$

In 18-20, solve for the variable: (check)

$$18. \frac{x-8}{x+4} = \frac{1}{4}$$

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

$$20. \frac{x}{6} - \frac{x+3}{3} = 2$$

Use Your calculator: #

21. If 12 apples cost \$3.20  
how much will 30 apples  
cost?

22. If 13 widgets cost  
\$4.50, how many can  
you buy for \$35.00?

23. If chemical spray is to  
be applied at 3 ounces  
per 125 square feet,  
how many ounces are  
needed for 1000 square  
feet?

24. If a car averages  
55 miles per hour,  
how long will it take  
to travel 2000 miles?

25. Solve for  $x$ :  $ax + b = c$

26. Solve for  $x$ :

$$ax = bx + c$$

- $$\frac{x^2-16}{4x+16} = \frac{(x-4)(\cancel{x+4})}{4(\cancel{x+4})}$$

$$= \frac{x-4}{4}$$
- $$\frac{6x^2y^3}{9x^2y^2} = \frac{2y}{3x^2}$$
- $$\frac{m-5}{5-m} = -1$$
- $$\frac{x^2-5x+6}{x^2+5x+6} = \frac{(x-2)(x-3)}{(x+3)(x+2)}$$

$$\frac{x^2-2x-15}{x^2-8x+15} = \frac{(x-5)(x+3)}{(x-2)(x-3)}$$

$$= \frac{x-2}{x+3}$$
- $$\frac{a^2+a-2}{a^2-a^3} \div \frac{a^2-3a+2}{a^3-2a^2}$$

$$= \frac{(a+2)(\cancel{a-1})}{\cancel{a^3}(a-1)} \cdot \frac{a^2(a-2)}{(\cancel{a^2})(a-1)}$$

$$= \frac{a+2}{a(a-1)}$$
- $$\frac{1}{8} \div \frac{1}{12}$$

$$8 = 2^3$$

$$12 = 2^2 \cdot 3$$

$$LCD = 2^3 \cdot 3 = 24$$
- $$\frac{1}{27} \div \frac{1}{12}$$

$$27 = 3^3$$

$$12 = 2^2 \cdot 3$$

$$LCD = 2^2 \cdot 3^3 = 108$$
- $$\frac{1}{12x^3y^4} \div \frac{1}{20x^4y^2}$$

$$LCD = 60x^4y^4$$
- $$\frac{3}{(x+3)(x-2)} \div \frac{2}{(x+3)(x+1)}$$

$$LCD = (x+3)(x-2)(x+1)$$
- $$\frac{1}{(x+3)(x+2)} \div \frac{1}{(x+2)(x+2)}$$

$$LCD = (x+3)(x+2)^2$$
- $$\frac{y^2}{y+4} + \frac{4y}{y+4}$$

$$= \frac{y^2+4y}{y+4}$$

$$= \frac{y(y+4)}{y+4} = y$$
- $$\frac{3x^2-4x}{x^2-4} - \frac{2x^2-3x+6}{x^2-4}$$

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

$$= \frac{x^2-x-6}{x^2-4}$$

$$= \frac{(x-3)(x+2)}{(x-2)(x+2)}$$
- $$\frac{5}{4x^2} + \frac{2}{3x}$$

$$LCD = 12x^2$$

$$= \frac{5 \cdot 3}{4x^2 \cdot 3} + \frac{2 \cdot 4x}{3x \cdot 4x}$$

$$= \frac{15+8x}{12x^2}$$
- $$\frac{7}{x} - \frac{5}{x-3}$$

$$LCD = x(x-3)$$

$$= \frac{7(x-3)}{x(x-3)} - \frac{5x}{(x-3)x}$$

$$= \frac{7x-21-5x}{x(x-3)} = \frac{2x-21}{x(x-3)}$$
- $$\frac{7}{t(t-3)} + \frac{-4}{(t-3)t}$$

$$= \frac{7-4t}{t(t-3)}$$
- $$\frac{6}{k(k+3)} - \frac{1}{k(k-1)} + \frac{2}{(k+3)(k-1)}$$

$$LCD = k(k+3)(k-1)$$

$$= \frac{6(k-1)}{k(k+3)(k-1)} - \frac{1(k+3)}{k(k-1)(k+3)} + \frac{2k}{(k+3)(k-1)k}$$

$$= \frac{6k-6-k-3+2k}{k(k+3)(k-1)} = \frac{7k-9}{k(k+3)(k-1)}$$
- $$\frac{x}{(x+3)(x+1)} - \frac{4}{(x-4)(x+1)}$$

$$LCD = (x+3)(x+1)(x-4)$$

$$= \frac{x(x-4)}{(x+3)(x+1)(x-4)} - \frac{4(x+3)}{(x-4)(x+1)(x+3)}$$

$$= \frac{x^2-4x-4x-12}{(x+3)(x+1)(x-4)}$$

$$= \frac{x^2-8x-12}{(x+3)(x+1)(x-4)}$$
- $$\frac{x-8}{x+4} = \frac{1}{4}$$

$$4(x-8) = (x+4) \cdot 1$$

$$4x-32 = x+4$$

$$3x = 36$$

$$x = 12$$
- $$\frac{x}{x-2} = \frac{3}{x-4}$$

$$x(x-4) = 3(x-2)$$

$$x^2-4x = 3x-6$$

$$x^2-7x+6 = 0$$

$$(x-6)(x-1) = 0$$

$$x = 6 \quad x = 1$$
- $$\frac{13}{4.50} = \frac{x}{55.00}$$

$$4.50x = 13(35)$$

$$x = \frac{13(35)}{4.50} = 101.11$$

101 widgets.
- $$\frac{30}{3.20} = \frac{x}{125}$$

$$12x = 30(3.20)$$

$$12x = 9600$$

$$x = 800$$
- $$\frac{30}{125} = \frac{x}{1000}$$

$$125x = 3000$$

$$x = 24$$
- $$\frac{55 \text{ mi}}{1 \text{ hr}} = \frac{2000 \text{ mi}}{x \text{ hr}}$$

$$55x = 2000$$

$$x = \frac{2000}{55}$$

$$= 36.36 \text{ hrs}$$
- $$ax+b=c$$

$$ax=c-b$$

$$x = \frac{c-b}{a}$$
- $$ax=bx+c$$

$$ax-bx=c$$

$$x(a-b)=c$$

$$x(a-b)=c \rightarrow x = \frac{c}{a-b}$$