

SHOW ALL WORK ON THIS TEST OR ON SEPARATE PAPER. Circle answers.  
TURN IN ALL WORKSHEETS. CALCULATORS ARE PERMITTED ON THIS TEST.

In 1 - 6, reduce all fractions completely:

1.  $\frac{12}{30}$

2.  $\frac{16x^3y^3}{24xy^6}$

3.  $\frac{85x^{12}}{15x^6}$

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

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

6.  $\frac{8x^2-16x}{x^2-4x+4}$

In 7 - 8, multiply or divide the fractions. Reduce all fractions.

7.  $\frac{x^2-16}{x^2-3x-4} \cdot \frac{x^2-1}{x^2+5x+4}$

8.  $\frac{5x+10y}{x-y} \div \frac{x^2+2xy}{x^2-y^2}$

In 9 - 14, add or subtract the fractions. Reduce if possible.

$$9. \quad \frac{4}{x} + \frac{3}{x}$$

$$10. \quad \frac{3}{10x} + \frac{7}{10x}$$

$$11. \quad \frac{x^2}{x-4} - \frac{4x}{x-4}$$

$$12. \quad \frac{x^2+4}{x+2} + \frac{4x}{x+2}$$

$$13. \quad \frac{x^2}{x-3} - \frac{16x-39}{x-3}$$

$$14. \quad \frac{x^2-12x}{x-6} + \frac{x^2-5x+30}{x-6}$$

In 15 - 20, solve for x:

$$15. \quad \frac{x}{x-2} = \frac{4}{5}$$

$$16. \quad \frac{x}{x+4} = \frac{6}{x-4}$$

$$17. \quad \frac{6}{x-4} = \frac{2}{x-4}$$

$$18. \quad ax + b = c$$

$$19. \quad ax + bx = c$$

$$20. \quad ax = bx + c$$

In 21 - 23, find the LCD only.

21.  $\frac{1}{12}, \frac{1}{6}$

22.  $\frac{1}{12x^4}, \frac{1}{20x^2y^2}$

23.  $\frac{1}{x^2-5x+6}, \frac{1}{x^2-6x+9}$

In 24 - 27, add or subtract the fractions:

24.  $\frac{4}{3x^2} + \frac{2}{27x^3}$

25.  $\frac{3}{10x^3} - \frac{4}{15xy}$

26.  $\frac{5}{x^2-5x+6} - \frac{3}{x^2-9}$

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

28. Solve the equation:  $\frac{x+1}{3} - \frac{x+2}{2} = 3$

In 29 - 30, give an equation, and solve:

29. If 12 ounces of potato chips cost, \$2.49, how much would you expect to pay for 40 ounces?

30. If 300 grams of a product cost \$7.39, how many grams could you buy for \$25?

# BASIC ALGEBRA EXAM 3 FORM TR Solutions

1.  $\frac{12}{30} = \frac{2}{5}$     2.  $\frac{16x^3y^3}{24xy^6} = \frac{2x^2}{3y^3}$     3.  $\frac{85x^{12}}{15x^6} = \frac{17x^6}{3}$     4.  $\frac{x-3}{x^2-9} = \frac{x-3}{(x-3)(x+3)} = \frac{1}{x+3}$

5.  $\frac{x^2+3x+2}{x^2-4x-5} = \frac{(x+2)(x+1)}{(x-5)(x+1)} = \frac{x+2}{x-5}$   
 6.  $\frac{8x^2-16x}{x^2-4x+4} = \frac{8x(x-2)}{(x-2)(x-2)} = \frac{8x}{x-2}$   
 7.  $\frac{x^2-16}{x^2-3x-4} \cdot \frac{x^2-1}{x^2+5x+4} = \frac{(x-4)(x+4)}{(x-4)(x+1)} \cdot \frac{(x-1)(x+1)}{(x+4)(x+1)} = \frac{x-1}{x+1}$

8.  $\frac{5x+10y}{x-y} \div \frac{x^2+2xy}{x^2-y^2} = \frac{5(x+2y)}{x-y} \cdot \frac{(x-y)(x+y)}{x(x+y)} = \frac{5(x+y)}{x}$   
 9.  $\frac{4}{x} + \frac{3}{x} = \frac{7}{x}$   
 10.  $\frac{3}{10x} + \frac{7}{10x} = \frac{10}{10x} = \frac{1}{x}$   
 11.  $\frac{x^2-4x}{x-4} - \frac{4x}{x-4} = \frac{x^2-4x-4x}{x-4} = \frac{x^2-8x}{x-4} = \frac{x(x-8)}{x-4} = x$

12.  $\frac{x^2+4}{x+2} + \frac{4x}{x+2} = \frac{x^2+4x+4}{x+2} = \frac{(x+2)(x+2)}{x+2} = x+2$   
 13.  $\frac{x^2}{x-3} - \frac{16x-39}{x-3} = \frac{x^2-16x+39}{x-3} = \frac{(x-13)(x-3)}{x-3} = x-13$

14.  $\frac{x^2-12x}{x-6} + \frac{x^2-5x+30}{x-6} = \frac{x^2-12x+x^2-5x+30}{x-6} = \frac{2x^2-17x+30}{x-6} = \frac{(2x-5)(x-6)}{x-6} = 2x-5$   
 15.  $\frac{x}{x-2} = \frac{4}{5} \Rightarrow 5x = 4x-8 \Rightarrow x = -8$   
 16.  $\frac{x}{x+4} = \frac{6}{x-4} \Rightarrow x^2-4x = 6x+24 \Rightarrow x^2-10x-24 = 0 \Rightarrow (x-12)(x+2) = 0 \Rightarrow x = 12, x = -2$   
 17.  $\frac{6}{x-4} = \frac{2}{x-4} \Rightarrow 6x-24 = 2x-8 \Rightarrow 4x = 16 \Rightarrow x = 4$   
 No Solution

18.  $ax+b=c \Rightarrow ax=c-b \Rightarrow x = \frac{c-b}{a}$   
 19.  $ax+bx=c \Rightarrow x(a+b)=c \Rightarrow x = \frac{c}{a+b}$   
 20. Solve for a:  
 $ax+bx=c$   
 $ax = c-bx$   
 $\frac{ax}{x} = \frac{c-bx}{x}$   
 $a = \frac{c-bx}{x}$

21.  $\frac{1}{12}, \frac{1}{6}$  LCD = 12  
 22.  $\frac{1}{12x^4}, \frac{1}{20xy^2}$  LCD =  $2^2 \cdot 3 \cdot 5 \cdot x^4 \cdot y^3 = 60x^4y^3$   
 23.  $\frac{1}{(x-2)(x-3)(x-7)}$  LCD =  $(x-3)^2(x-2)$   
 24.  $\frac{4-9x}{3x^2-9x} + \frac{2}{27x^3} = \frac{36x+2}{27x^3} = \frac{2(18x+1)}{27x^3}$   
 25.  $\frac{3}{10x^3} - \frac{4}{15xy}$  LCD =  $30x^3y$   
 $\frac{3(3y)}{10x^3(3y)} - \frac{4(2x^2)}{15xy(2x^2)} = \frac{9y-8x^2}{30x^3y}$   
 26.  $\frac{5}{(x-3)(x-2)} - \frac{3}{(x-3)(x+3)}$  LCD =  $(x-3)(x-2)(x+3)$   
 $= \frac{5(x+3)}{(x-3)(x-2)(x+3)} - \frac{3(x-2)}{(x-3)(x+3)(x-2)} = \frac{5x+15-3x+6}{(x-3)(x-2)(x+3)} = \frac{2x+21}{(x-3)(x-2)(x+3)}$

$$27. \frac{2x}{(x-2)(x+2)} + \frac{3}{(x+3)(x-2)} \quad \text{LCD} = (x-2)(x+2)(x+3)$$

$$\frac{2x}{(x-2)(x+2)(x+3)} \cdot (x+3) + \frac{3}{(x+3)(x-2)(x+2)} \cdot (x+2)$$

$$= \frac{2x^2 + 6x + 3x + 6}{(x-2)(x+2)(x+3)} = \frac{2x^2 + 9x + 6}{(x-2)(x+2)(x+3)}$$

$$28. \frac{x}{3} - \frac{x+2}{2} = 1$$

$$2x - 3x - 6 = 6$$

$$\begin{array}{r} -x - 6 = 6 \\ +6 \quad +6 \end{array}$$

$$-x = 12$$

$$x = -12$$

$$29. \frac{1}{(x-3)(x-1)} - \frac{2}{(x+5)(x-1)} = \frac{1}{(x+5)(x-3)}$$

Forbidden  
Values:  
 $x \neq 3, 1, -5$

$$\frac{1}{(x-3)(x-1)(x+5)} - \frac{2}{(x-3)(x-1)(x+5)} = \frac{1}{(x+5)(x-3)}$$

$$x+5 - 2x + 6 = x - 1$$

$$-x + 11 = x - 1$$

$$\begin{array}{r} +x \qquad \qquad +x \\ \hline \end{array}$$

$$11 = 2x - 1$$

$$\begin{array}{r} +1 \qquad \qquad +1 \\ \hline \end{array}$$

$$12 = 2x$$

$$x = 6$$