

When there is an open mind there will always be a frontier. – C. Kettering

Factor each expression and then **cancel** common **factor** from **numerators** and **denominators**.

$$\frac{5x-15}{3x+9} \cdot \frac{4x+12}{6x-18} = \frac{5(x-3)}{3(x+3)} \cdot \frac{4(x+3)}{6(x-3)} = \frac{5}{3} \cdot \frac{4}{6} = \frac{5}{3} \cdot \frac{2}{3} = \frac{10}{9}$$

Multiply or divide and write each answer in lowest terms.

$$1. \frac{4x-24}{20x} \cdot \frac{5}{x-6}$$

$$2. \frac{2-t}{8} \div \frac{t-2}{6}$$

$$3. \frac{p^2+4p-5}{p^2+7p+10} \div \frac{p-1}{p+4}$$

$$4. \frac{2m^2-5m-12}{m^2-10m+24} \div \frac{4m^2-9}{m^2-9m+18}$$

$$5. \frac{2m^2+7m+3}{m^2-9} \cdot \frac{m^2-3m}{2m^2+11m+5}$$

$$6. \frac{m^2+3m+2}{m^2+5m+4} \cdot \frac{m^2+10m+24}{m^2+5m+6}$$

$$7. \frac{m^2+2mp-3p^2}{m^2-3mp+2p^2} \div \frac{m^2+4mp+3p^2}{m^2+2mp-8p^2}$$

Add or subtract and write each answer in lowest terms.

$$8. \frac{x^2}{x+5} + \frac{5x}{x+5}$$

$$9. \frac{y^2-3y}{y+3} + \frac{-18}{y+3}$$

$$10. \frac{x+2}{5x} + \frac{6x+3}{3x}$$

$$11. \frac{-1}{1-y} + \frac{3-4y}{1-y}$$

$$12. \frac{1}{a^2-1} - \frac{a-1}{a^2+3a-4}$$

$$13. \frac{4}{x^2-x} + \frac{6}{x^2+2x} - \frac{1}{x^2+x-2}$$

$$14. \frac{4y-1}{2y^2+5y-3} - \frac{y+3}{6y^2+y-2}$$

15. If the length of a rectangle is $\frac{3k+1}{10}$ and its width is $\frac{5}{6k+2}$ find its area.

Simplify each complex fraction.

$$16. \frac{\frac{2r^4t^2}{3t}}{\frac{5r^2t^5}{3r}}$$

$$17. \frac{\frac{\frac{1}{-}+x}{x}}{\frac{x^2+1}{8}}$$

$$18. \frac{\frac{\frac{6}{-}-\frac{1}{-}}{\frac{5}{-}-\frac{9}{-}}}{\frac{\frac{2}{-}+\frac{5}{-}}{\frac{5}{-}-\frac{3}{-}}}$$

$$19. \frac{\frac{\frac{1}{a^2}-\frac{1}{b^2}}{\frac{1}{a}-\frac{1}{b}}}{\frac{1}{a}-\frac{1}{b}}$$

$$20. \frac{\frac{\frac{1}{4}-\frac{1}{a^2}}{\frac{1}{2}+\frac{1}{a}}}{\frac{1}{2}+\frac{1}{a}}$$

$$21. \frac{\frac{\frac{2}{x-1}+2}{\frac{2}{x-1}-2}}{\frac{2}{x-1}-2}$$

Solve each equation.

$$22. \frac{3x}{5} - 6 = x$$

$$23. \frac{3p+6}{8} = \frac{3p-3}{16}$$

$$24. \frac{8k}{5} - \frac{3k-4}{2} = \frac{5}{2}$$

$$25. \frac{3}{x-1} + \frac{2}{4x-4} = \frac{7}{4}$$

$$26. \frac{3}{x+3} - \frac{2}{x-3} = \frac{-12}{x^2-9}$$

$$27. \text{Solve } \frac{1}{x+3} + \frac{x}{x+2} = 1$$

28. A hanging spring will stretch 4 in. if a weight of 8 lbs is placed at its end. How far will the spring stretch if the weight is increased to 10 lbs?

Answers

$$1. \frac{1}{x}$$

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

$$3. \frac{p+4}{p+2}$$

$$4. \frac{m-3}{2m-3}$$

$$5. \frac{m}{m+5}$$

$$6. \frac{m+6}{m+3}$$

$$7. \frac{m+4p}{m+p}$$

$$8. x$$

$$9. y-6$$

$$10. \frac{11x+7}{15x}$$

$$11. -4$$

$$12. \frac{-a^2+a+5}{(a+1)(a-1)(a+4)}$$

$$\begin{array}{llllll}
 \mathbf{13.} \frac{9x+2}{x(x+2)(x-1)} & \mathbf{14.} \frac{11y^2-y-11}{(2y-1)(y+3)(3y+2)} & \mathbf{15.} \frac{1}{4} & \mathbf{16.} \frac{2r^3}{5t^4} & \mathbf{17.} \frac{8}{x} & \mathbf{18.} \frac{49}{93} \\
 \mathbf{19.} \frac{b+a}{ab} & \mathbf{20.} \frac{a-2}{2a} & \mathbf{21.} \frac{x}{2-x} & \mathbf{22.} -15 & \mathbf{23.} -5 & \mathbf{24.} 5 & \mathbf{25.} 3 & \mathbf{26.} \emptyset
 \end{array}$$

$$\mathbf{27.} -4 \quad \mathbf{28.} 5 \text{ inches}$$

Divide the followings;

$$\mathbf{26.} \frac{16a^5 - 12a^4 + 8a^2}{-4a^3}$$

$$\mathbf{27.} (4x^3 - 4x^2 + 5x - 8) \div (2x - 1)$$

$$\mathbf{28.} (8x^3 - 10x^2 - x + 3) \div (2x + 1)$$

$$\mathbf{29.} \frac{9K^2 + 6K + 10}{3K - 2}$$

$$\mathbf{30.} \frac{X^2 - X - 6}{X - 3}$$

Answers

$$\mathbf{26.} -4a^2 + 3a - \frac{2}{a} \quad \mathbf{27.} 2x^2 - x + 2 + \frac{-6}{2x-1} \quad \mathbf{28.} 4x^2 - 7x + 3 \quad \mathbf{29.} 3k + 4 + \frac{18}{3k-2} \quad \mathbf{30.} x + 2$$