

1. Find the least common multiple for each group of polynomials.

a)  $12a^3b^2, -18ab^5$

b)  $4a + 8, 6a + 12, 3a - 6$

c)  $x^2 - 4x, x^2 - 16, x^2 + 6x + 8$

d)  $2x^3 - 16, x^2 + 2x + 4, (2 - x)^2$

2. Perform the operations and simplify.

a)  $\frac{xa^3}{2a^4} + \frac{21x^2}{35ax}$

b)  $\frac{3t+2}{t-4} - \frac{t-2}{t-4}$

c)  $\frac{x^3}{x^2-y^2} + \frac{y^3}{y^2-x^2}$

d)  $\frac{10}{4x-8} - \frac{15}{10-5x}$

e)  $\frac{x+1}{3x^2-2x-1} + \frac{x-1}{3x^2+4x+1}$

f)  $\frac{a+5}{a^3+27} - \frac{a-1}{a^2-9}$

g)  $\frac{-2}{y+2} + \frac{5}{y-2} + \frac{y+3}{y^2-4}$

h)  $\frac{5y}{1-2y} - \frac{2y}{2y+1} + \frac{3}{4y^2-1}$

i)  $\frac{p-10}{p^2-2p-15} + \frac{3}{p^2-25} - \frac{2}{p+3}$

j)  $\frac{3y}{y^2+yz-2z^2} + \frac{4y-1}{y^2-z^2}$

3. Given  $f(x) = -\frac{3}{x^2}$  and  $g(x) = \frac{x+3}{4x^2-32x}$ , find  $f(x) + g(x)$  and  $f(x) - g(x)$ .

4. An airplane flies  $m$  mi with a wind whose speed is  $w$  mph. On the return flight, the airplane flies against the same wind. The expression  $\frac{m}{s+w} + \frac{m}{s-w}$ , where  $s$  is the speed of the airplane in still air, represents the total time in hours that it takes to make the round-trip flight. Write a single rational expression representing the total time.