

SHARP

Worksheet 3 – Algebra: Algebraic Fractions

Grade 10 Mathematics

1. Simplify the following fractions (assume all denominators are non-zero):

a) $\frac{x^2-y^2}{2(x+y)}$

b) $\frac{-2x+4}{x-2}$

c) $\frac{x^2-3x-10}{3x-15}$

d) $\frac{x^2+3x-28}{x^2-16}$

e) $\frac{(x+1)(x^2-36)}{x^2+8x+12}$

f) $\frac{2x^2-4x-6}{2x^2-18}$

g) $\frac{8x^3+64y^3}{x^2-xy-6y^2}$

h) $\frac{ac+bd+bc+ad}{c^2-2cd-3d^2}$

i) $\frac{x^2-9}{x^3+27}$

j) $\frac{3a(a+b)-4b(a+b)}{a^2-b^2}$

2. Simplify the following fractions (assume all denominators are non-zero):

a) $\frac{x^2-y^2}{3} \times \frac{6x-3y}{x^3+y^3}$

b) $\frac{2x^3-16y^3}{4x+8y} \times \frac{x^2-4y^2}{x^2+2xy+4y^2}$

c) $\frac{x^2+5x+6}{2x+4} \times \frac{x-3}{x^2-9}$

d) $\frac{x^2+3x-4}{x^3+64y^3} \div \frac{x^2-1}{x^2-4xy+16y^2}$

e) $\frac{x^2+4x-45}{x^2-25} \div \frac{x^2-5x+25}{x^3+125}$

f) $\frac{ax+ay}{x^2-y^2} \times \frac{x^2+2xy-3y^2}{a}$

g) $\frac{x^2-16}{x^3+64} \div \frac{3x-12}{x^2-4x+16}$

h) $\frac{x^2-6x+5}{x^2+x+1} \div \frac{3x-15}{x^3-1}$

i) $\frac{8x^3-27}{4x^2-9} \times \frac{8x-12}{4x^2+6x+9}$

j) $\frac{x^2-5x+6}{x^3-8} \div \frac{x^2-9}{x^3+2x^2+4x}$

3. Simplify the following (assume all denominators are non-zero):

a) $\frac{x+3}{x} + \frac{x+3}{4}$

b) $\frac{x}{x+1} - \frac{6}{x-1}$

c) $\frac{3}{x} + \frac{x+8}{x-4} - \frac{x^2+3}{x^2-4x}$

d) $\frac{x+2}{x^2-1} + \frac{x+5}{x-1} - \frac{x-3}{x+1}$

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

f) $\frac{3x-1}{x+2} - \frac{x-5}{3x} - \frac{4}{4x+8}$

g) $\frac{-6}{x+2} - \frac{-x+3}{x} + \frac{x-1}{3x}$

h) $\frac{x^2+7x}{x^2-4} + \frac{x-3}{2-x} - \frac{5}{x+2}$

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

j) $\frac{a}{ax+a} - \frac{x-2}{x+1} + \frac{x+2}{x-1}$

