SIMPLIFYING ALGEBRAIC FRACTIONS

Task 1 – Fully simplify the following fractions.

1) $\frac{12ab}{6}$

2) $\frac{15x^2}{5x}$

3) $\frac{9x}{3x}$

4) $\frac{14a^2}{7a}$

5) $\frac{20x^2y}{5xy}$

6) $\frac{18m}{6n}$

7) $\frac{16x^2}{4x}$

Task 2 – Fully simplify the following fractions.

8) $\frac{6x^2+12x}{6x}$

9) $\frac{8x+16}{4}$

10) $\frac{10x^2-5x}{5x}$

11) $\frac{12x^2y+6xy}{6xy}$

12) $\frac{15x^2+30x}{3x}$

Task 3 – Fully simplify the following fractions.

13) $\frac{x^2-9}{x-3}$

14) $\frac{x^2+5x}{x}$

15) $\frac{2x^2-8}{2x-4}$

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

17) $\frac{3x^2-12x}{3x^2}$

18) $\frac{x^2-5x+6}{x^2-3x}$

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

20) $\frac{x^2+10x+21}{x^2+3x}$

21) $\frac{x^2-x-72}{x^2+17x+72}$

22) $\frac{x^2+7x+10}{x^2+5x}$

23) $\frac{2x^2-6x}{x^2-x-6}$

24) $\frac{x^2+2x-24}{x^2-3x-4}$

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

26) $\frac{4x^2-16}{2x^2+6x-20}$

27) $\frac{6x^2+19x+10}{4x^2-25}$

28) $\frac{6x^2-7x-3}{4x^2-9}$

Task 4 – Write each of the following as a single fraction in simplest form.

29) $\frac{x}{3}+\frac{2x}{5}$

30) $\frac{x}{x+2}+\frac{2}{x+1}$

31) $\frac{5x}{6}-\frac{x}{2}$

32) $\frac{x+3}{x}-\frac{2}{x}$

33) $\frac{3x}{4}\times\frac{8}{x^2}$

34) $\frac{x^2-4}{x}\times\frac{x}{x+2}$

35) $\frac{6x}{5}\div\frac{3}{x}$

36) $\frac{x^2-9}{x}\div\frac{x-3}{x+1}$

37) $\frac{3x+4}{2x}+\frac{4}{7}$

38) $\frac{4}{3x}-\frac{3}{7x}+\frac{1}{x}$

39) $\frac{3x+1}{5x}+\frac{7-6x}{3x}$

40) $\frac{16-x^2}{2x^2+3x+1}\div\frac{x+4}{x+1}$

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

42) $\frac{1}{4x^2-49}\div\frac{1}{4x+14}$

Challenge

43) Show that $\frac{6x^4}{4x^2-16} \div \frac{3x^5}{2x-4}$ can be written as $\frac{1}{x(x+a)}$ where a is an integer.

44) Show that

$$\frac{2}{x+3} \times \frac{x^2-9}{x^2+2x-15} \div \frac{5}{x+5}$$

can be written in the form $\frac{a}{b}$ where a and b are integers.

45) Given that $m = \frac{20}{4x-9}$ and $x = \frac{10}{5y-2}$, express m in the form, $\frac{ay+b}{cy+d}$ where a, b, c and d are integers. Give your answer in simplest form.

46) Show that

$$\frac{25x^2-81}{5x^2-4x-9} \times \frac{x^2-1}{5x+9} - (x-6)$$

can be expressed as a single integer.

47) Show that

$$\frac{16xy-3x}{7xy} - \frac{2y-3}{7y} + \frac{1-4x}{2x}$$

can be expressed as $\frac{1}{px}$ where p is an integer.

48) Show that

$$\frac{1}{5x-1} \times \frac{25x^2-1}{5x^2-24x-5} - \frac{3}{x-2}$$

can be written as $\frac{a+bx}{x^2+cx+d}$ where a, b, c and d are integers.

49) Show that

$$\left(\frac{3}{2x-3} - \frac{2}{2x+1}\right) \div \frac{6x^2+29x+9}{6x^2+5x+1}$$

can be written as $\frac{1}{ax+b}$ where a and b are integers.

50) Show that

$$\frac{4}{x-2} - \frac{1}{x+1} \div \frac{3x^2-8x+4}{3x^2+x-2}$$

can be written in the form $\frac{a}{bx+c}$ where a, b and c are integers.