

**Simplify each expression by reducing BEFORE multiplying.**

1)  $\frac{9}{7} \cdot \frac{3}{8}$

2)  $\frac{12}{3} \cdot \frac{12}{10}$

3)  $\frac{4}{6} \cdot \frac{7}{3}$

4)  $\frac{\frac{6}{6}}{\frac{7}{12}}$

5)  $\frac{\frac{3}{4}}{\frac{3}{10}}$

6)  $\frac{\frac{6}{11}}{\frac{10}{6}}$

**Simplify each expression by reducing BEFORE multiplying. Then state any values that will make any part of the expression undefined- these values must be excluded.**

7)  $\frac{3}{13k} \div \frac{9}{15k}$

8)  $\frac{15x}{14} \cdot \frac{13}{18}$

9)  $\frac{14}{15x^3} \div \frac{2}{18}$

10)  $\frac{2v^3}{19v} \cdot \frac{9}{2}$

11)  $\frac{12}{11} \div \frac{11m^3}{17m^3}$

12)  $\frac{18k^2}{13k^3} \cdot \frac{11k^3}{7}$

**Simplify each expression by factoring first, reducing, then multiplying. Then state any value(s) that will make any part of the expression undefined- these values must be excluded.**

13)  $\frac{6}{5x^2} \div \frac{x+4}{5x^3+20x^2}$

14)  $\frac{10x-10}{10} \div \frac{9}{2x}$

15)  $\frac{a^2+11a+10}{a-5} \cdot \frac{1}{a+10}$

16)  $\frac{m+9}{4m+36} \div \frac{1}{4m^2+4m}$

17)  $\frac{b^2-b-56}{b-2} \cdot \frac{b-2}{b^2+9b+14}$

18)  $\frac{1}{x+9} \div \frac{x+2}{x^2+17x+72}$

19)  $\frac{5x+1}{20x+4} \div \frac{1}{4x}$

20)  $(3p-3) \cdot \frac{7}{21-18p-3p^2}$

21)  $\frac{5}{35k-10} \div \frac{5k^2}{42k-12}$

22)  $(5x^2-38x+21) \div \frac{5x^2+12x-9}{x+8}$

23)  $\frac{4r}{14r+7} \cdot \frac{14r^2-9r-8}{7r-8}$

24)  $5x \cdot \frac{3x}{3x^2+24x}$