Must Know Questions To Ace Algebraic Fractions and Formulae

1.	Simplify each of the following: a) $\frac{5x^2\,(x-y)}{(6x^2\,y)^2} \div \frac{30x^2-30y^2}{64x^3}$ b) $\frac{\sqrt{25a^2b^2}}{35a^3} \times \frac{49ab^3}{\sqrt{100b^2}}$
2.	Simplify the following fraction: $\frac{9x^2-25}{8x+2} \div [\frac{3x}{4x+1} - \frac{-5-x}{(4x+1)(x-3)}]$
3.	Solve the following equations: a) $2x = \sqrt{\frac{1-x}{2}} - 3$ b) $\frac{3}{x-2} + \frac{5}{4-2x} = 2$
4.	Express the following as a single fraction in its simplest form: $\frac{2x+12}{x^2+3x-18} - \frac{3}{3-x}$
5.	In the following equations, make c the subject of the formula. a) $\frac{c}{a-2b} + 5c = \frac{1}{c}$ b) $d = \sqrt{\frac{cef}{2c-f}} + f$

6.	Given that $\frac{2x+y}{3x+2y}=\frac{5}{9}$, find the value of $\frac{x}{y}$.
7.	Jeremy bought x notebooks for \$20. He could have bought 5 more notebooks if each notebook costs 20¢ less. a) Form an equation in x and show that it reduces to $x^2+5x-500=0$ b) Hence, solve the equation and find the value of x.

Answer Key:

1. a) $\frac{8x}{27xy^2+27y^3}$

   b) $\frac{7b^3}{10a}$

2. $\frac{3x^2-4x-15}{2\,(x-1)}$

3. a) $x=-1$ or $x=-\frac{17}{8}$

   b) $x=2\frac{1}{4}$

4. $\frac{5}{x-3}$

5. a) $c=\pm\sqrt{\frac{a-2b}{1+5a-10b}}$

   b) $c=\frac{f\,(d-f)^2}{2\,(d-f\,)^2-ef}$

6. $\frac{x}{y}=\frac{1}{3}$

7. a) $(x+5)\left(\frac{20}{x}-0.20\right)=20$

   $x^2+5x-500=0$ (shown)

   b) $(x-20\,)(x+25)=0$

   $x=20 \;\; or \;\; x=-25\,(rej\,)$