Must Know Questions To Ace Basic Algebra & Algebraic Manipulation

1.	Simplify each of the following: a) $2x-(3x+5y)+(4y-7x)$ b) $(-6x-7y+2p)-(-3x+4p)-2y$
2.	Simplify each of the following: a) $4\,(\,4x-6y)-3(7+5x-8y)$ b) $\frac{n}{4}\,(4m-12)-\frac{m}{3}\,(6n-9)$ c) $10x-3\,\{2y-3\,[\,7x-2\,(4x-y\,)]\}$
3.	Express each of the following as a single fraction: a) $\frac{3x+7}{3}-\frac{5x+5}{15}$ b) $\frac{4(2x-5y)}{2}-(2x-3y)-\frac{2(x+2y)}{6}$
4.	Factorise each of the following: a) $6xy^3-14x^3y^2-2xy$ b) $\frac{1}{3}p^3q^2+3pq^3r$
5.	Factorise each of the following: a) $2x\,(\,3y-4)-(\,4-3y\,)$ b) $2ax+6by-4bx-3ay$

6.	a) Factorise $21pq - 28pr$. b) Hence, evaluate $21 \times 5 \times 11 - 28 \times 5 \times 8$.
7.	Given that $x = 2, y = -4$ and $z = -3$, evaluate $$y^2 - \frac{3\,(x-y) - z}{2z - y}$$
8.	Julian in n years old now. Julian's brother, Edwin is 3 years younger than 2 times her age. The sum of their parents' ages is 1 year more than 3 times the sum of their ages. a) Simplify, in terms of n, i) Edwin's age ii) The sum of Julian's parents' ages iii) The sum of the ages of Julian, Edwin and their parents. b) If $n = 9$, find the sum of the ages of Julian, Edwin and their parents 4 years later.

Answer Key:

1. a) $-8x - y$
   b) $-2p - 3x - 9y$

2. a) $x - 21$
   b) $-mn - 3n + 3m$
   c) $x + 12y$

3. a) $\frac{2(x+3)}{3}$

   b) $\frac{5x-23y}{3}$

4. a) $2xy\,(\,3y^2 - 7x^2y - 1\,)$
   b) $\frac{1}{3}\,pq^2\,(\,p^2 + 9qr\,)$

5. a) $(\,2x + 1\,)(\,3y - 4\,)$
   b) $(2x - 3y)(\,a - 2b)$

6. a) $7p\,(\,3q - 4r\,)$
   b) $7\,(5)[(3)(11) - 4(8)]$
   $= 35$

7. 26.5

8. ai) $2n - 3$
   aii) $9n - 8$
   aiii) $12n - 11$

   b) 109