Quadratics & Algebra Review Sheet

1. Expand and collect like terms

   (a) $(2a+b)(b-a)-(a^2+b^2)$. $\boxed{ab-3a^2}$

   (b) $(2a+b)^2-(a-b)^2$. $\boxed{3a^2+6ab}$

2. Find the equation of the line through $(2,4)$ and $(2,-5)$. $\boxed{x=2}$

3. Find the equation of the line through $(7,-2)$ and $(9,-3)$, eliminating all fractions from your answer. $\boxed{2y+x=3}$

4. Find the equation of the line through $(0,4)$ perpendicular to $4x+3y=0$, eliminating all fractions from your answer. $\boxed{4y=3x+16}$

5. Make x the subject in $a\sqrt{x^3-b^2}=c$. $\boxed{x=\sqrt[3]{\left(\frac{c}{a}\right)^2+b^2}}$

6. Make x the subject in $a(x+b)=c(x-d)$. $\boxed{x=\frac{ab+cd}{c-a}}$

7. Make x the subject in $\frac{x}{x-1}=a$. $\boxed{x=\frac{a}{a-1}}$

8. Factorise

   (a) x^2+x-12. $\boxed{(x+4)(x-3)}$

   (b) $2x^2+4x$. $\boxed{2x(x+2)}$

   (c) $6x^2+x-2$. $\square$

   (d) $px+py+qx+qy$. $\boxed{(p+q)(x+y)}$

   (e) $4x^2-25$. $\boxed{(2x+5)(2x-5)}$

   (f) $4x^2-2x-6$. $\boxed{2(2x-3)(x+1)}$

   (g) $800x^2-500+1800x$. $\square$

9. Solve

   (a) $(2x+1)(x-3)=0$.

   (b) $x^2=3x$.

   (c) $x^2=5x+14$.

   (d) $(x+3)^2=(x+4)^2$.

   (e) $2x^2+3x=14$.

   (f) $(x-1)(x+2)(2x-1)(5x+3)=0$. [not a lot of working for this part... don't multiply out!]

10. Solve the following sets of simultaneous equations

    (a) $\begin{matrix}2x+y=-1\\4x-3y=8\end{matrix}$. $\boxed{(\frac{1}{2},-2)}$

    (b) $\begin{matrix}y=x-3\\x^2+2y^2=9\end{matrix}$. $\square$

    (c) $\begin{matrix}x+2y=4\\x^2-4y^2=-8\end{matrix}$. $\boxed{(1,\frac{3}{2})}$