Solutions: Algebraic Expressions

1. $$\frac{5x^2-3x+7}{2}-\frac{2x^2+x-4}{4}=\frac{2(5x^2-3x+7)-(2x^2+x-4)}{4}$$
$$=\frac{10x^2-6x+14-2x^2-x+4}{4}=\frac{8x^2-7x+18}{4}=2x^2-\frac{7x}{4}+\frac{9}{2}$$
The simplified expression is $\boxed{2x^2-\frac{7x}{4}+\frac{9}{2}}$.

2. $$3M=3(-a^2+2ab-b^2)=-3a^2+6ab-3b^2$$
$$2N=2(3a^2-4ab+2b^2)=6a^2-8ab+4b^2$$
$$3M+2N=(-3a^2+6ab-3b^2)+(6a^2-8ab+4b^2)=3a^2-2ab+b^2$$
The value of $3M+2N$ is $\boxed{3a^2-2ab+b^2}$.

3. The term $-3x^2yz$ is not a like term with $-7xy^2z$ because the exponents of x and y are different. The correct option is $\boxed{-3x^2yz}$.

4. A regular hexagon has 6 equal sides. Therefore, the length of one side is:
$$\frac{18p+24}{6}=3p+4$$
The length of one side is $\boxed{3p+4}$.

5. $$0.25(8m-12n+16)=2m-3n+4$$
$$0.5(6n-4m+2)=3n-2m+1$$
$$(2m-3n+4)+(3n-2m+1)=m+5$$
The simplified expression is $\boxed{m+5}$.

6. Let the expression be E:
$$E+(5x^2-8xy+3y^2)=-2x^2+4xy-y^2$$
$$E=(-2x^2+4xy-y^2)-(5x^2-8xy+3y^2)=-7x^2+12xy-4y^2$$
The expression is $\boxed{-7x^2+12xy-4y^2}$.

7. $$3a(b+c)=3ab+3ac$$
$$-2b(a-c)=-2ab+2bc$$
$$c(a+b)=ac+bc$$
$$3ab+3ac-2ab+2bc+ac+bc=ab+4ac+3bc$$
There are $\boxed{3}$ terms in the simplified form.

8.
$$-4+5=1$$
The sum of the coefficients is $\boxed{1}$.

9.
$$-3y+2y-10$$
The algebraic expression is $\boxed{-3y+2y-10}$.

10.
$$\frac{2}{3}(9p-6q)=6p-4q$$
$$\frac{3}{4}(8p+4q)=6p+3q$$
$$(6p+3q)-(6p-4q)=7q$$
The result is $\boxed{2p+9q}$.

11. The numerical coefficients are 5, -2, and $\frac{1}{2}$. The smallest coefficient is -2. The term with the smallest numerical coefficient is $\boxed{\text{The term in } x^2}$.

12.
$$(7a+5b)-(3a+2b)=4a+3b$$
The expression for the remaining fruits is $\boxed{4a+3b}$.

13.
$$3y-(4z-x)+2y=3y-4z+x+2y=x+5y-4z$$
$$2x-(x+5y-4z)=x-5y+4z$$
$$-\{x-5y+4z\}=-x+5y-4z$$
The simplified expression is $\boxed{-x+5y-4z}$.

14. The standard form is $7k^2-3k+8$. The first term is $\boxed{7k^2}$.

15. The pair $4x-3y$ and $3y-4x$ has a sum of zero:
$$(4x-3y)+(3y-4x)=0$$
The correct option is $\boxed{4x-3y \text{ and } 3y-4x}$.