General Algebra Worksheet

1. Expand and simplify:
   (a) $(x-5)(2x+3)$. $\boxed{2x^2-7x-15}$
   (b) $(x^3-2)^2$. $\boxed{x^6-4x^3+4}$
   (c) $x^2(2x+3)$. $\boxed{2x^3+3x^2}$
   (d) $x(x-5)(x-7)$. $\boxed{x^3-12x^2+35x}$
   (e) $(x+1)(x+3)(2x-3)$. $\boxed{2x^3+5x^2-6x-9}$

2. Solve the following:
   (a) $\frac{x+2}{3}-\frac{2x-1}{2}=x+3$. $\boxed{x=-\frac{11}{10}}$
   (b) $\frac{x-3}{5}+\frac{2x-1}{2}=\frac{x}{2}+2$. $\boxed{x=\frac{31}{7}}$
   (c) $\frac{2}{3x-1}=3$. $\boxed{x=\frac{5}{9}}$
   (d) $\frac{5}{3-x}=7$. $\boxed{x=\frac{16}{7}}$
   (e) $x^2+5x=24$. $\boxed{x=-8 \text{ or } x=3}$
   (f) $3x^2=10+x$. $\boxed{x=-\frac{5}{3} \text{ or } x=2}$
   (g) $(x+1)(x+3)=3$. $\boxed{x=0 \text{ or } x=4}$
   (h) $(x+1)^2=17+2x$. $\boxed{x=4 \text{ or } x=-4}$
   (i) $(2x+1)(x-3)=-6$. $\boxed{x=\frac{3}{2} \text{ or } x=1}$

3. Make x the subject:
   (a) $ax+v=c$. $\boxed{x=\frac{c-v}{a}}$
   (b) $ax-t=q+p$. $\boxed{\frac{q+p+t}{a}}$
   (c) $a\sqrt{x}=b+c$. $\boxed{x=\frac{(b+c)^2}{a^2}=\frac{b^2+2bc+c^2}{a^2}}$
   (d) $ax=bx+c$. $\boxed{x=\frac{c}{a-b}=\frac{-c}{b-a}}$
   (e) $a(x+y)=b(x-z)$. $\boxed{x=\frac{ay+bz}{b-a}=\frac{-ay-bz}{a-b}}$
   (f) $\frac{x+1}{x+2}=a$. $\boxed{x=\frac{2a-1}{1-a}=\frac{1-2a}{a-1}}$

4. In a triangle ABC, angle ABC is a right angle. If AB=7 and BC=8, find angle BCA. $\boxed{41.185925\ldots^\circ}$

5. In a triangle ABC, angle ABC is a right angle. If AB=13 and ACB=72, find length AC. $\boxed{13.6690089\ldots^\circ}$

6. In the sequence $7, 10, 13, 16, 19\ldots$ find a formula for the nth term. Use this formula to find the 2300th term. $\boxed{6904}$

7. In the sequence $2, -3, -8, -13\ldots$ find the 4100th term. $\boxed{-20493}$