

Solve each equation by factoring and the Zero Product Property:

1. $(w-3)(w+6)=0$
 $w-3=0$ or $w+6=0$
 $+3$ $+3$
3 or -6

2. $x(x+1)(x+5)=0$
 $x=0$ $x+1=0$ $x+5=0$
0, -1, -5

3. $(2x-3)(3x+8)=0$
 $2x-3=0$ or $3x+8=0$
 $+3$ $+3$ $+3x=-8$
 $\frac{2x}{2}=\frac{3}{2}$ $\frac{3x}{3}=\frac{-8}{3}$
 $\frac{3}{2}$ or $-\frac{8}{3}$

4. $x^2+4x-12=0$
 $(x+8)(x-4)=0$
 $x+8=0$ or $x-4=0$
 -8 -8 $+4$ $+4$
-8 or 4

5. $x^2+11x+24=0$
 $(x+8)(x+3)=0$
 $x+8=0$ or $x+3=0$
 -8 -8 -3 -3
-8, -3

6. $x^2-2x-15=0$
 $(x-5)(x+3)=0$
5, -3

7. $x^2-3x=10$
 $x^2-3x-10=0$ (Standard Form)
 $(x-5)(x+2)=0$
 $x-5=0$ or $x+2=0$
5 or -2

8. $x^2+10x=-16$
 $x^2+10x+16=0$ (Standard Form)
 $(x+8)(x+2)=0$
-8, -2

9. $x^2+36=12x$
 $x^2-12x+36=0$ (Standard Form)
 $(x-6)(x-6)=0$
6 or 6
6

10. $2x^2+6x+18=0$
 $2(x^2+3x+9)=0$ (GCF)
 - can't factor
 - Try Quadratic Formula
 $\frac{-6 \pm \sqrt{36-4(2)(18)}}{4}$ $\frac{-6 \pm \sqrt{-108}}{4}$
no solutions

11. $6x^2-13x=6$
 $6x^2-13x+6=0$
 $(6x^2-9x)(-4x+6)$
 $3x(2x-3)-2(2x-3)$
 $(3x-2)(2x-3)=0$ (Factored)
 $3x-2=0$ or $2x-3=0$
 $3x=2$ $2x=3$
 $\frac{2}{3}$ or $\frac{3}{2}$

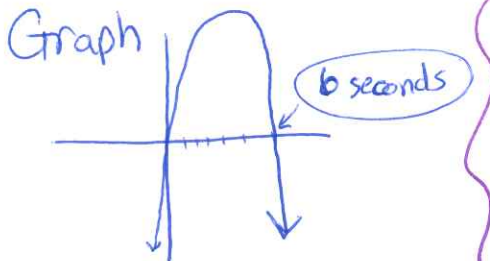
12. $5x^2-6=-7x$
 $5x^2+7x-6=0$
 $5x^2+10x-3x-6=0$
 $5x(x+2)-3(x+2)=0$
 $(x+2)(5x-3)=0$ (Factored)
 $x+2=0$ $5x-3=0$
-2, $\frac{3}{5}$

13. $3x^5-12x^3=0$
 $3x^3(x^2-4)=0$
 $3x^3(x+2)(x-2)=0$ (DOTS)
 $3x^3=0$ or $x+2=0$ or $x-2=0$
0, -2, 2

14. $9y^2=-45y$
 $9y^2+45y=0$
 $9y(y+5)=0$
 $9y=0$ or $y+5=0$
0 or -5

15. $2m^3-2m^2-3m+3=0$
 $(2m^3-2m^2)(-3m+3)$
 $2m^2(m-1)-3(m-1)=0$
 $2m^2-3=0$ or $m-1=0$
 $\frac{2m^2}{2}=3$
 $m^2=1.5$
 $\sqrt{m^2}=\sqrt{1.5}$
1 or $\sqrt{1.5}$

16. The height of a flare shot into the air can be approximated by the function $h = -16t^2 + 95t + 6$, where h is the height in feet in and t is the time in seconds. Find the time it takes the flare to hit the ground.



Quick Formula
 $\frac{-95 \pm \sqrt{95^2 - 4(-16)(6)}}{-32}$
 $\frac{-95 \pm \sqrt{9409}}{-32}$
 can't be -1
 $\frac{-95 + \sqrt{9409}}{-32}$ $\frac{-95 - \sqrt{9409}}{-32}$
6

Factor $-16t^2 + 96t - 1t + 6$
 $-16t(t-6) - 1(t-6)$
 $(t-6)(-16t-1)$
6 or $-\frac{1}{16}$
6 seconds