

Zero Product Property
If $pq = 0$, then $p=0$ or $q=0$

Solve each of the following using the zero product property.

1. $x(x-5) = 0$
 $x=0$ or $x-5=0$
 $x=5$
 $x = \{0, 5\}$

2. $(2c-1)(c+4)^2 = 0$
 $2c-1=0$ or $c+4=0$
 $2c=1$ $c=-4$ double root or
 $c=\frac{1}{2}$ multiplicity of 2

3. $(x-2)^2(x^2-9) = 0$
 $(x-2)^2(x+3)(x-3) = 0$
 $x-2=0$ or $x+3=0$ or $x-3=0$
 $x=2$ or $x=-3$ or $x=3$
 (d.r.)

Use factoring and the Zero Product Property to solve.

1. $3r^2 = 10r + 8$
 $3r^2 - 10r - 8 = 0$ * get equation = 0
 $(3r+2)(r-4) = 0$
 $3r+2=0$ or $r-4=0$
 $3r=-2$ $r=4$
 $r=-\frac{2}{3}$ or $r=4$
 Using zero product property

2. $x^2 + 25 = 10x$
 $x^2 - 10x + 25 = 0$
 $(x-5)(x-5) = 0$ or $(x-5)^2 = 0$
 $x-5=0$
 $x=5$

3. $(a+3)(a-3) = 40$
 $a^2 - 9 = 40$
 $a^2 - 49 = 0$
 $(a+7)(a-7) = 0$
 $a+7=0$ or $a-7=0$
 $a=-7$ or $a=7$
 or $a = \pm 7$

Use factoring and the Zero Product Property to find the zeroes of each quadratic function.

1. $f(x) = x^2 + 7x + 6$

$$0 = x^2 + 7x + 6$$

$$0 = (x+6)(x+1)$$

$$x+6=0 \quad x+1=0$$

$$x=-6 \text{ or } x=-1$$

2. $g(x) = 15x^2 - 8x + 1$

$$0 = 15x^2 - 8x + 1$$

$$0 = (5x-1)(3x-1)$$

$$5x-1=0 \quad \text{or} \quad 3x-1=0$$

$$5x=1 \quad \text{or} \quad 3x=1$$

$$x = \frac{1}{5} \quad \text{or} \quad x = \frac{1}{3}$$