SOLVING QUADRATIC EQUATIONS

Solve by Inspection:

1. $x(x-2)=0$
2. $(x-1)(x+2)=0$
3. $(2x-5)(x+1)=0$

Solve using the "Factor method":

4. $x^2-11x=0$
5. $9x-4x^2=0$
6. $5x^2=3x$
7. $x^2-9=0$
8. $4x^2-25=0$
9. $x^2-x-12=0$
10. $x^2+3x-28=0$
11. $x^2-16x+28=0$
12. $x^2=7x-6$
13. $6x^2+11x+4=0$
14. $8x^2+6=16x$

Solve by "Completing the square":

15. $x^2+8x=9$
16. $x^2-10x+24=0$
17. $x^2+6x+1=0$
18. $2x^2+6x=3$

Answers: (1) $x=0,2$ (2) $x=1,-2$ (3) $x=2.5,-1$ (4) $x=0,11$ (5) $x=0,2.25$ (6) $x=0,0.6$
(7) $x=3,-3$ (8) $x=2.5,-2.5$ (9) $x=4,-3$ (10) $x=7,-4$ (11) $x=14,2$ (12) $x=1,6$
(13) $x=-\frac{1}{2},-\frac{4}{3}$ (14) $x=\frac{1}{2},\frac{3}{2}$ (15) $x=-9,1$ (16) $x=6,4$ (17) $x=-3\pm2\sqrt{2}$ (18) $x=\frac{-3\pm\sqrt{15}}{2}$

Solving quadratics using the formula:-

The 2 possible solutions to: $ax^2+bx+c=0$ are .... $x=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$

To find them:

Step 1: write down the values of the co-efficients a, b and c to start your working.

Step 2: Find the *discriminant*, $\Delta=b^2-4ac$ as a separate calculation.

Step 3: The solutions are .... $x_1=\frac{-b+\sqrt{\Delta}}{2a}$ and $x_2=\frac{-b-\sqrt{\Delta}}{2a}$

EXERCISE – Solve using the quadratic formula:

(1) $3x^2-7x-2=0$

(2) $x^2+6x=3$

(3) $6x^2-10=\frac{x}{2}$

(4) $n(2n+9)=-3$

(5) $8x^2=5-6x$

(6) $2x^2-4x-1=0$

Answers:

(1) $x=\frac{7\pm\sqrt{73}}{6}$ (2) $x=-3\pm2\sqrt{3}$ (3) $x=\frac{4}{3}$ *or* $-\frac{5}{4}$ (4) $n=\frac{-9\pm\sqrt{57}}{4}$

(5) $x=\frac{1}{2}$ *or* $-\frac{5}{4}$ (6) $x=\frac{2\pm\sqrt{6}}{2}$