Dear Parents / Students

Due to the unprecedented situation, Knowledgeplus Training center is mobilized and will keep accompanying and supporting our students through this difficult time. Our Staff will be continuously, sending notes and exercises on a weekly basis through what's app and email. Students are requested to copy the notes and do the exercises on their copybooks. The answers to the questions below will be made available on our website on knowledgeplus.mu/support.php. Please note that these are extra work and notes that we are providing our students and all classes will be replaced during the winter vacation. We thank you for your trust and are convinced that, together, we will overcome these troubled times.

Knowledgeplus Training Center

Mathematics

Garde 9

Week 5

Notes and Exercise

Note:(All the Notes, Examples and Exercise are on the photos and Note:(Please copy all the Notes, Examples and Exercises on your copy book).

Mathematics Grade 9 weeks 5

Quadratic equation

Solving Quadratics equation

Solution of quadratics equation

If $m \times n = 0$

Either $m = 0$ or $n = 0$

Example

~~Solving~~ Solve the quadratic equations

(a) $x(x-2) = 0$ (b) $(x-2)(x+3) = 0$

Solution

(a) $x(x-2) = 0$

either $x = 0$ or $x - 2 = 0$

$x = 2$

(b) $(x-2)(x+3) = 0$

either $x - 2 = 0$ or $x + 3 = 0$

$x = 2$ $x = -3$

~~Sup~~ ~~Cha~~ Catching point

Question

$x(2-x) = 0$

either $x = 0$ or $2 - x = 0$

$2 = x$

$\therefore x = 0$ or $x = 2$

Remember $a = b$

$b = a$

Attempt Ex1(a,b,e,f,i,j)

1. Solve the following quadratic equations.

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

(e) $(x - 1)(x + 5) = 0$ (f) $(x + 2)(x - 4) = 0$

(i) $(3x - 1)(2x + 5) = 0$ (j) $(5x + 2)(3x - 4) = 0.$

Attempt Ex2(a-j)

2. Solve the following equations.

(a) $x(x-5)=0$ (b) $x(x+2)=0$ (c) $x(x-1)=0$ (d) $2x(x-1)=0$ (e) $3x(x+5)=0$

(f) $-4x(x-2)=0$ (g) $-x(x+2)=0$ (h) $x(2-x)=0$ (i) $x(3-x)=0$ (j) $2x(5-x)=0$

Example

Solve the following equation

(a) $x^2-4=0$ (b) $x^2-3x=0$ (c) $x^2+2x-15=0$

(d) $2x^2-4x=16$

Solution

(a) $x^2-4=0$

$x^2-2^2=0$

$(x-2)(x+2)=0$

either $x-2=0$ or $x+2=0$

$x=2$ $x=-2$

(b) $x^2-3x=0$

$x(x-3)=0$

either $x=0$ or $x-3=0$

$x=3$

You must remove common first then Continue.

(c) $x^2+2x-15=0$ $P=-15$

$x^2-3x+5x-15=0$ $S=2$

$x(x-3)\,5(x-3)=0$ $f=-3, 5$

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

either $x-3=0$ or $x+5=0$

$x=3$ $x=-5$

You must factorise the equation first, using Product, Sum, factor then continue.

(d) $2x^2-4x=16$

$2x^2-4x-16=0$ $P=-32$

$2x^2+4x-8x-16=0$ $S=-4$

$2x(x+2)-8(x+2)=0$ $f=4, -8$

$(x+2)(2x-8)=0$

either $x+2=0$ or $2x-8=0$

$x=-2$ $2x=8$

$x=\frac{8}{2}$

$x=4$

Put all number on the LHS to RHS so that the equation can = 0

Example when the main variable x is negative

Solve $-x^2-3x=0$

Solution

$-x^2-3x=0$

$-x(x+3)=0$

Either $-x=0$ or $x+3=0$

$x=\frac{0}{-1}$ $\quad x=-3$

$x=0$ $\quad x=-3$

Another example of solving equation

Solve $2x(5-x)=0$

Solution

$2x(5-x)=0$

Either $2x=0$ or $5-x=0$

$x=\frac{0}{2}$ $\quad -x=-5$

$x=0$ $\quad x=\frac{-5}{-1}$

$x=5$

$2\times x=0$

$x=\frac{0}{5}$

when multiplication goes to the other it become divide division same as division it become multiplication

Solve $x(x-1)=72$

$x(x-1)=72$

$x(x-1)-72=0$

$x^2-x-72=0$ $\quad P=-72$

$x^2+8x-9x-72=0$ $\quad S=-1$

$x(x+8)-9(x+8)=0$ $\quad f=8,9$

$(x+8)(x-9)=0$

Either $x+8=0$ or $x-9=0$

$x=-8$ $\quad x=9$

Solve $x^2=2x+80$ → Turn This into this

$x^2-2x-80=0$

↳ before solving and then continue.

Attempt Ex3(a,b,c,f,g,h)

3. Solve the following quadratic equations.

(a) $x^2 - 2x = 0$ (b) $x^2 + 3x = 0$ (c) $x^2 - 5x = 0$

(f) $2x + x^2 = 0$ (g) $4x - x^2 = 0$ (h) $-x^2 - 3x = 0$

Attempt Ex4(a-j)

4. Solve the following quadratic equations.

(a) $x^2 + 8x + 15 = 0$ (b) $x^2 - 6x + 8 = 0$ (c) $x^2 - 5x + 6 = 0$

(e) $x^2 - 3x - 4 = 0$ (f) $x^2 + 14x + 40 = 0$ (g) $x^2 - x - 2 = 0$

(i) $x^2 - 11x + 30 = 0$ (j) $x^2 + 5x - 14 = 0$

Attempt Ex5(a-j)

5. Solve the following quadratic equations.

(a) $x^2 + 4x = 32$ (b) $x^2 = 2x + 80$ (c) $x^2 = 132 - x$ (d) $x^2 = 14x - 49$ (e) $3x = 28 - x^2$

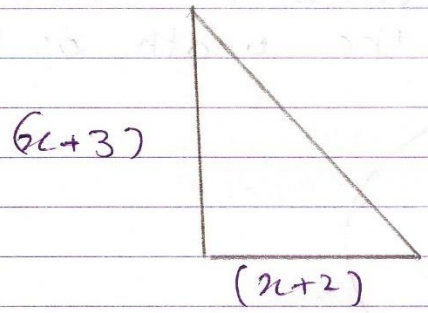
(f) $x(x - 2) = 8$ (g) $x(x + 3) = 10$ (h) $x(x - 1) = 72$ (i) $x(x - 3) = 40$ (j) $(x - 2)^2 = 9$

Solving problems involving quadratic equation

Example

The base of a right angle triangle is $(x+2)$ cm and its height is $(x+3)$ cm. Given that its area is 6 cm², Calculate the base and the height of the triangle or find the value of x

Solution



Area of triangle $= \frac{1}{2} \times$ base $\times$ height

$$6 = \frac{1}{2}(x+2)(x+3)$$

$$12 = (x+2)(x+3)$$

$$12 = x(x+3)+2(x+3)$$

$$12 = x^2+3x+2x+6$$

$$12 = x^2+5x+6$$

$$x^2+5x+6 = 12$$

$$x^2+5x+6-12 = 0$$

$$x^2+5x-6 = 0 \qquad P = -6,\ S = 5$$

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

either $x-1=0$ or $x+6=0$

$x = 1$ $\quad x = -6$

More example on solving problems involving Quadratics equation and also example using examination question and exams exercise.