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 10&11

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 form 4 and form 5

Most quadratic equations are solved by the method of factorisation. At times, the method doesn't work. When the factorisation fails, the roots of the quadratic equation $ax^2+bx+c=0$ can be obtained by using the quadratic formula. The ~~four~~ formula is given below.

$$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$$

Example

Solve the equation $2x^2-5x+1=0$, giving your answer correct to 3 decimal places.

Solution

$2x^2-5x+1=0$

$a=2$, $b=-5$, $c=1$

$$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$$

Note: Always write the formula so that it will be easy to remember.

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

$$x = \frac{5 \pm \sqrt{25-8}}{4}$$

$$x = \frac{5 \pm \sqrt{17}}{4}$$

either $x = \frac{5+\sqrt{17}}{4}$ or $x = \frac{5-\sqrt{17}}{4}$

$= 2.2807$ $\quad$ $= 0.2192$

$\therefore x = 2.281$ $\quad$ $x = 0.219$

Note: ~~Next~~ for next week you will receive examination type question and examples on Quadratic equation.

Simultaneous Equation

method of solving simultaneous equation

1. The elimination method
2. The substitution method
3. The graphical method
4. The matrix method

Note: The elimination and the substitution method are the most popular, we only use these two method.

The Elimination Method

Example 1

Solve the following pair of simultaneous equations by the elimination method.

$$2x + 3y = 12$$
$$3x + 4y = 1$$

Solution

Step1 label the two equation as (1) and (2)

$$2x + 3y = 12 \quad \ldots (1)$$
$$3x - 4y = 1 \quad \ldots (2)$$

Step2 Now you will have to choose which variable to eliminate either x or y.

step2 In this case we will choose the variable y

$2x + 3y = 12 \quad \ldots (1) \quad (\times 4)$

$3x - 4y = 1 \quad \ldots (2) \quad (\times 3)$

$8x + 12y = 48 \quad \ldots (3)$

$9x - 12y = 3 \quad \ldots (4)$

step 3 eliminate the variable y.

Note: In simultaneous equation

when

+	+
−	

−	−
−	

+	−
+	

$$\begin{aligned} 8x + 12y &= 48 \quad \ldots (3) \\ 9x - 12y &= 3 \quad \ldots (4) \\ \hline 17x &= 51 \end{aligned}$$

In this case we will Add (plus) (+)

You will that: $+12 + (-12) = 0$

so the variable y is cancel.

$17x = 51$

$x = \frac{51}{17}$

$x = 3$

Step5 Replace ~~eq~~ the answer of y in any of the two equation.

In this case we will choose eq 1

~~Replace y 3 in~~
Replace y=3 in equation (1)

$2x + 3y = 12$
$2x + 3(3) = 12$
$2x + 9 = 12$
$2x = 12 - 9$
$2x = 3$
$x = \frac{3}{2}$

$x = 1\frac{1}{2}$

So: $\therefore x = 1\frac{1}{2}$ and $y = 3$

Now you can test if your answer is good or not by replace x and y in any of the two equation (1) or (2)

$\cancel{2x + 3y = 12}$
$\cancel{2(1\tfrac{1}{2}) + 3(3) =}$

$\cancel{2(\tfrac{3}{2}) + 9 =}$
$\cancel{3 + 9 = 12}$

$2x + 3y = 2(1\frac{1}{2}) + 3(3)$
$= 2(\frac{3}{2}) + 3(3)$
$= 3 + 9$
$= 12$

Note: You donot have to check it in exam. You can check onin margin or with pencile and you erase. Just to make sure your answer is corret.

↳ Now you can see that your answer is 12 so that mean that your answer is good

Attempt:Ex1(i-xii)

1. Solve the following pairs of simultaneous equations by using the elimination method.

(i) $x + y = 8$ $x - y = 0$	(ii) $3x - 2y = 8$ $x - y = 5$	(iii) $5x - 6y = 14$ $x - y = 3$	(iv) $3x - 2y = 5$ $-5x + 2y = 9$
(v) $2x + 3y = 8$ $3y - x = 5$	(vi) $3x - 5y = 13$ $x + 5y = 7$	(vii) $2x + y = 3$ $3x - 2y = 1$	(viii) $x + 2y = 4$ $2x + 3y = 7$
(ix) $7x = 5y + 4$ $2x - 5y = -6$	(x) $4x - 3y = 10$ $3x + 2y = -1$	(xi) $2x + 3y = 13$ $5x - 4y = -2$	(xii) $9x - 2y = 13$ $7x - 3y = 0$

The substitution Method

Example 2

Solve the following pair of simultaneous equations by the substitution method.

$$3x + 2y = 19$$
$$x + 3y = 11$$

Solution

$$3x + 2y = 19 \quad \ldots (1)$$
$$x + 3y = 11 \quad \ldots (2)$$

You will have to make either ~~x or~~ the variable x or y subject of formula in any of the two equation. In this case we will use equation 2.

$$x + 3y = 11$$
$$x = 11 - 3y \quad \ldots (3)$$

Now put ~~in~~ the equation (3) in equation (1)

$$3x + 2y = 19$$
$$3(11 - 3y) + 2y = 19$$
$$33 - 9y + 2y = 19$$
$$33 - 7y = 19$$
$$-7y = 19 - 33$$
$$-7y = -14$$
$$y = \frac{-14}{-7}$$
$$y = 2$$

Now replace $y=2$ in equation (3)

$$x = 11 - 3y$$
$$x = 11 - 3(2)$$
$$x = 11 - 6$$
$$x = 5$$

$\therefore$ $x=5$ and $y=2$

if you want to check:

$$x+3y = 11$$
$$5 + 3(2)$$
$$5+6 = 11$$

No need to check your answer all the time.

Attempt:Ex1(i-viii).

1. Solve the following pairs of simultaneous equations by using the substitution method.

(i) $x + y = 7$ $x - y = 5$	(ii) $2x - y = 4$ $x + 2y = 7$	(iii) $4x + y = -12$ $2x + 5y = -6$	(iv) $5x - y = 5$ $3x + 2y = 29$
(v) $2x + 3y = 1$ $x + 2y = 0$	(vi) $5x - 2y = -11$ $2x + y = 1$	(vii) $3x - 4y = 7$ $2x - y = 3$	(viii) $y = 2x$ $y = 3x - 1.$