IX Revision Worksheet (H.W-9)

1) Write the coefficient of y in the expansion of $(5-y)^2$

2) Factorise each of the following:-

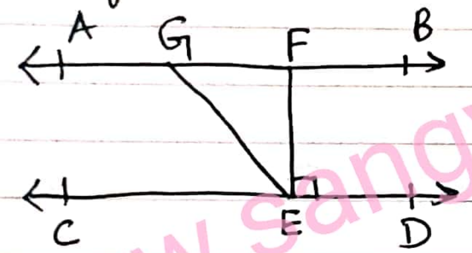
(i) $64a^3-27b^3-144a^2b+108ab^2$

(ii) $27p^3-\frac{1}{216}-\frac{9}{2}p^2+\frac{1}{4}p$

3) Find the value of the polynomial $p(y)=y^2-5y+6$ at $y=-2$.

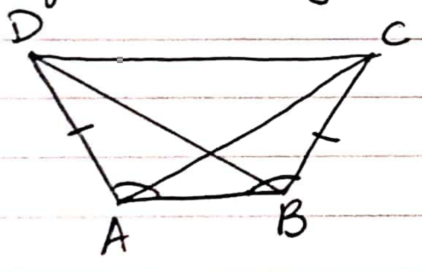
4) Find the value of a and b in $\frac{5+2\sqrt{3}}{7+4\sqrt{3}}=a+b\sqrt{3}$

5) If (-1) is a zero of the polynomial $p(x)=ax^3-x^2+x+4$, then find the value of 'a'.

6) 

If $AB \parallel CD$, $EF \perp CD$ and $GED=126^\circ$, find $\angle AGE$, $\angle GEF$ and $\angle FGE$.

7) Two adjacent angles on a straight line are in the ratio $5:4$, then find the measure of each one of these angles.

8) 

ABCD is a quadrilateral in which $AD=BC$ and $\angle DAB=\angle CBA$. Prove that (i) $\Delta ABD \cong \Delta BAC$

(ii) $BD=AC$

(iii) $\angle ABD=\angle BAC$.

9) A rabbit covers y metres distance by walking 10 metres in slow motion and the remaining by x jumps, each jump contains 2 metres. Express this information in linear equation.

10) Represent $\sqrt{2}$ on the real number line.

IX Revision Worksheet (H.W-9 Solutions)

1) $(5-y)^2 = 25+y^2-10y$

coefficient of $y = \underline{\underline{-10}}$

2) (i) $x^3 - y^3 - 3x^2y + 3xy^2 = (x-y)^3$

$64a^3 - 27b^3 - 144a^2b + 108ab^2$

$= (4a)^3 - (3b)^3 - 3\times(4a)^2\times 3b + 3\times 4a\times(3b)^2$

$= (4a-3b)^3 = \underline{\underline{(4a-3b)(4a-3b)(4a-3b)}}$

(ii) $(3p)^3 - \left(\frac{1}{6}\right)^3 - 3\times(3p)^2\times\frac{1}{6} + 3\times 3p\times\left(\frac{1}{6}\right)^2$

$= \left(3p-\frac{1}{6}\right)^3 = \underline{\underline{\left(3p-\frac{1}{6}\right)\left(3p-\frac{1}{6}\right)\left(3p-\frac{1}{6}\right)}}$

3) $p(y) = y^2-5y+6$

At $y=-2$,

$p(-2) = (-2)^2 - 5(-2)+6$

$= 4+10+6 = \underline{\underline{20}}$

4) $\frac{5+2\sqrt{3}}{7+4\sqrt{3}} = \frac{(5+2\sqrt{3})(7-4\sqrt{3})}{(7+4\sqrt{3})(7-4\sqrt{3})} = \frac{35-20\sqrt{3}+14\sqrt{3}-24}{49-48}$

$= \frac{11-6\sqrt{3}}{1} = 11-6\sqrt{3}$

On comparing with $a+b\sqrt{3}$, $a=11$ //

$b=-6$ //

5) Since (-1) is a zero of the polynomial $p(x) = ax^3-x^2+x+4$,

then $p(-1)=0$

$\Rightarrow a(-1)^3-(-1)^2+(-1)+4=0$

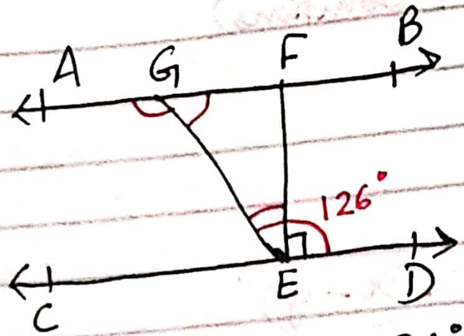
$\Rightarrow -a-1-1+4=0$

$\Rightarrow -a+2=0$

$\Rightarrow -a=-2$

$\therefore \underline{\underline{a=2}}$

6)

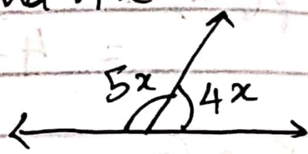


$\angle AGE = \angle GED = \underline{\underline{126°}}$ (alternate interior angles, AB||CD and GE is the transversal)

$\angle GEF = \angle GED - \angle FED$
$= 126° - 90°$
$= \underline{\underline{36°}}$

$\angle FGE = 180° - \angle AGE$ (linear pair)
$= 180° - 126°$
$= \underline{\underline{54°}}$

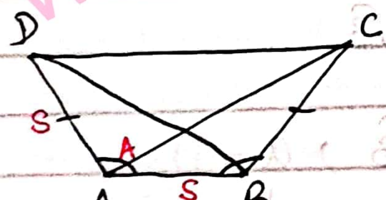
7) Let the adjacent angles be $5x$ and $4x$.



$5x + 4x = 180°$ (linear pair)
$\Rightarrow 9x = 180°$
$\therefore x = \frac{180°}{9} = \underline{\underline{20°}}$

$\therefore$ The angles are $5 \times 20 = 100°$ and $4 \times 20 = 80°$

8)



Given: in quadrilateral ABCD,
$AD = BC$
$\angle DAB = \angle CBA$

To prove: (i) $\triangle ABD \cong \triangle BAC$
(ii) $BD = AC$
(iii) $\angle ABD = \angle BAC$

Proof: (i) In $\triangle ABD$ and $\triangle BAC$,
$AD = BC$ (given)
$\angle DAB = \angle CBA$ (given)
$AB = AB$ (given)
$\therefore \triangle ABD \cong \triangle BAC$ (by SAS congruency criterion)

(ii) Thus $BD = AC$ (by CPCT)

(iii) Also, $\angle ABD = \angle BAC$ (by CPCT). Hence Proved.

9) Distance covered by the rabbit in slow motion = 10m

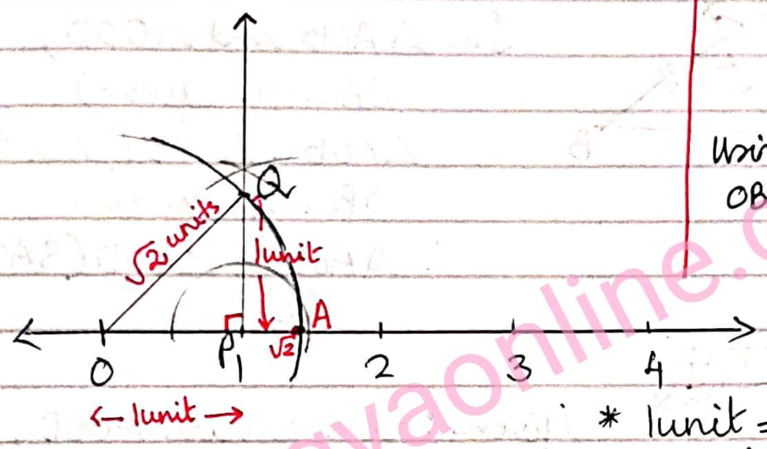
distance covered in x jumps $= 2 \times x = 2x$ m

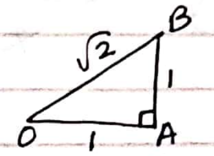
Total distance covered $= y$ m

Thus, $y = 10 + 2x$

$\Rightarrow 2x - y + 10 = 0$ is the required linear equation in two variables which is of the form $ax + by + c = 0$.

10)





Using Pythagoras Theorem,

$OB^2 = OA^2 + AB^2$

$= 1^2 + 1^2 = 2$

$\therefore OB = \sqrt{2}$ units

* 1unit = 2cm

Thus A represents $\sqrt{2}$ on the number line.

Steps of Construction:-

(i) Mark 0, 1, 2, 3 etc on the number line with 1unit = 2cm scale.

(ii) Construct 90° at 1 and take 1unit on the perpendicular. Join OQ

(iii) With O as centre and OQ as radius, draw an arc intersecting the number line at A. A represents $\sqrt{2}$ on the number line.

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