Subject: Computer graphics Topic : Reflection example problems Name of Teacher: Simna v j Academic year: 2020-2021

#### PRACTICE PROBLEMS BASED ON 2D REFLECTION

## Reflection

- Reflection is a kind of rotation where the angle of rotation is 180 degree.
- The reflected object is always formed on the other side of mirror.
- The size of reflected object is same as the size of original object.

#### **Reflection On X-Axis:**

This reflection is achieved by using the following reflection equations-

• 
$$Y_{new} = -Y_{old}$$

#### **Reflection On Y-Axis:**

• This reflection is achieved by using the following reflection equations-

• 
$$X_{new} = -X_{old}$$

#### Problem-01:

 Given a triangle with coordinate points A(3, 4), B(6, 4), C(5, 6). Apply the reflection on the X axis and obtain the new coordinates of the object.

# <u>Solution-</u> For Coordinates A(3, 4)

Applying the reflection equations, we have-  $X_{new} = X_{old} = 3$  $Y_{new} = -Y_{old} = -4$ 

New coordinates of A after reflection = (3, -4).

#### For Coordinates B(6, 4)

Applying the reflection equations, we have-

 $X_{new} = X_{old} = 6$  $Y_{new} = -Y_{old} = -4$ 

New coordinates of B after reflection = (6, -4).

#### For Coordinates C(5, 6)

Applying the reflection equations, we have-

 $X_{new} = X_{old} = 5$  $Y_{new} = -Y_{old} = -6$ 

New coordinates of C after reflection = (5, -6).

New coordinates of the triangle after reflection = A(3, -4), B(6, -4), C(5, -6).



#### Problem :2

 Given a triangle with coordinate points A(3, 4), B(6, 4), C(5, 6). Apply the reflection on the Y axis and obtain the new coordinates of the object.

#### Given-

- Old corner coordinates of the triangle =
  A (3, 4), B(6, 4), C(5, 6)
- Reflection has to be taken on the Y axis

#### For Coordinates A(3, 4)

Let the new coordinates of corner A after reflection =  $(X_{new}, Y_{new})$ .

Applying the reflection equations, we have-

$$X_{new} = -X_{old} = -3$$
  
 $Y_{new} = Y_{old} = 4$ 

New coordinates of corner A after reflection = (-3, 4).

### For Coordinates B(6, 4)

Applying the reflection equations, we have-

 $X_{new} = -X_{old} = -6$  $Y_{new} = Y_{old} = 4$ 

New coordinates of corner B after reflection = (-6, 4).

### For Coordinates C(5, 6)

Applying the reflection equations, we have-

 $X_{new} = -X_{old} = -5$  $Y_{new} = Y_{old} = 6$ 

New coordinates of corner C after reflection = (-5, 6).

