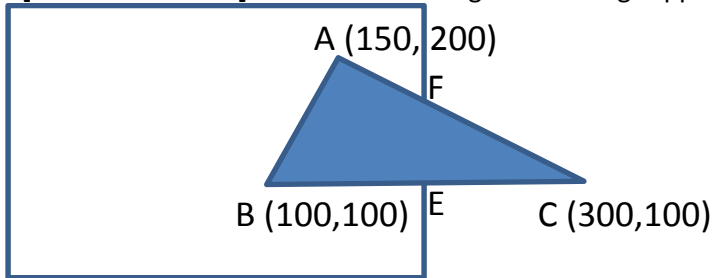


## Pop Quiz (Week 8) [20 mins] – 20 pts

Name: \_\_\_\_\_ Student ID: \_\_\_\_\_

**Please show your work for partial credits.**

- 1) [13=1+3+2+2+3+2] Consider the triangle ABC being clipped at E and F.



- a) If E is the middle point of BC, what is the x-max of the window?

$$(100+300)/2 - \text{since it is midpoint} = 200$$

- b) Using the computed x-max, find the interpolation coefficients (the weights for A and B) for F?

We want to find coefficients  $k$  and  $(1-k)$  such that

$$kA + (1-k)C = F$$

We know that x-coordinate of F is 200. Therefore,

$$150k + 300(1-k) = 200.$$

Solving this, we get  $k = 2/3$ ,  $1-k = 1/3$

- c) Using these interpolation coefficients, find the 2D coordinates of F?

Only the x-coordinate of F needs to be found. This is

$$2/3 * 200 + 1/3 * 100 = 166.67$$

- d) If the grayscale colors at A and C are 120 and 60 respectively, what will be the interpolated grayscale value at F?

Colors are interpolated the same way as coordinates. Therefore, color at F

$$2/3 * 120 + 1/3 * 60 = 100$$

e) If the Z-value at A and C are 30 and 60 respectively, what is interpolated depth at F?

The z-interpolation is done by reciprocal. Therefore

$$1/Z_F = 2/3 * 1/30 + 1/3 * 1/60$$

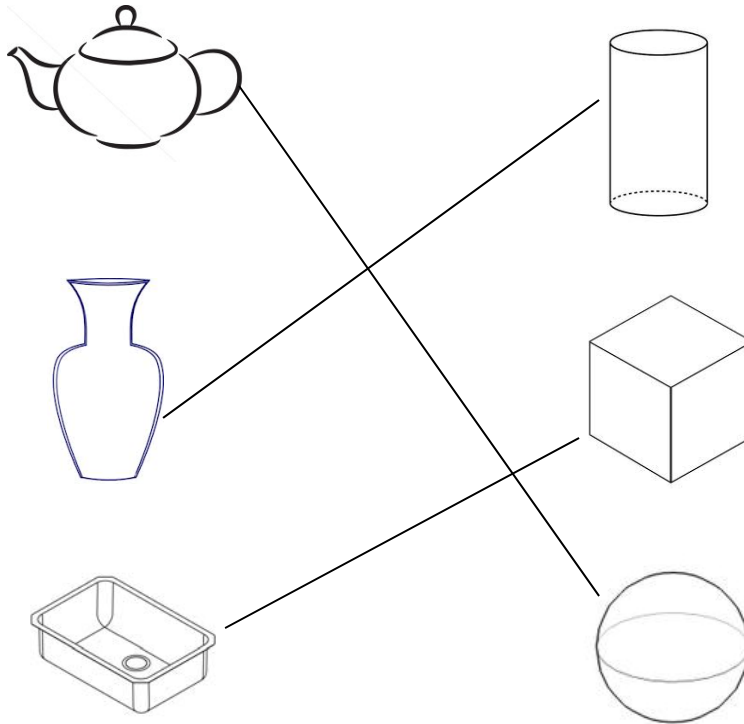
Solving this, the depth at F is 36.

f) When rendering F, you find that the depth buffer at that point is set at 40. Would F get drawn or not? Provide **one line** justification of your answer.

The depth buffer value at F of 40 indicates a depth of an earlier render primitive to be greater than F. Therefore, F being in front should be rendered.

[7=3+2+2] On the left you see models that you would like to texture map. On the right you see the choice of intermediate geometry you have.

a. Find the matching intermediate geometry that you have to use for each of the objects in the left.



- b. Using the right intermediate geometry helps in
- Proper sampling of the texture
  - Reducing distortions in the mapped texture
  - Achieving anti-aliasing
- c. Texture mapping is

- i. View Dependent (changes with change of viewpoint)
- ii. View Independent (does not change with change of viewpoint)