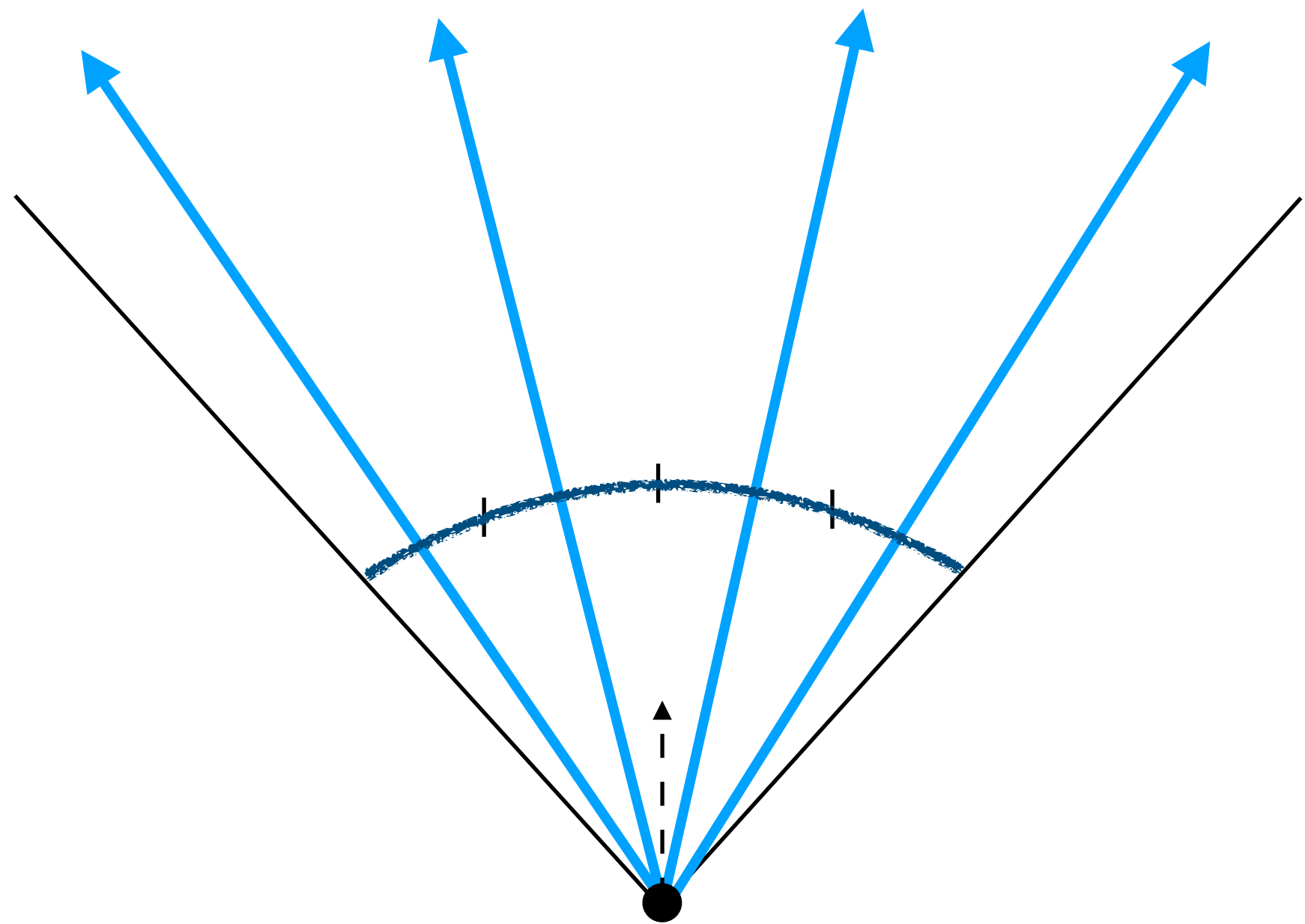
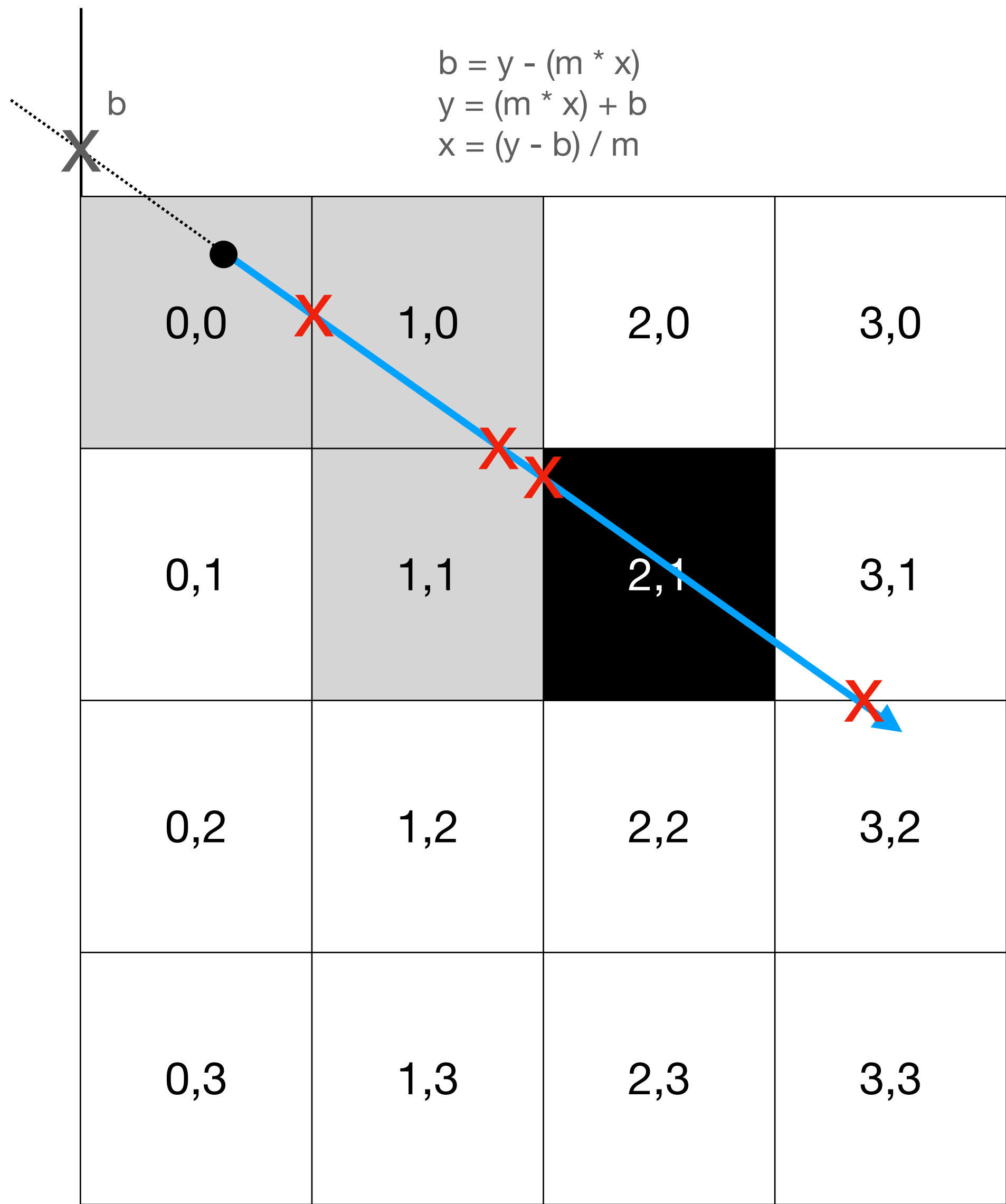


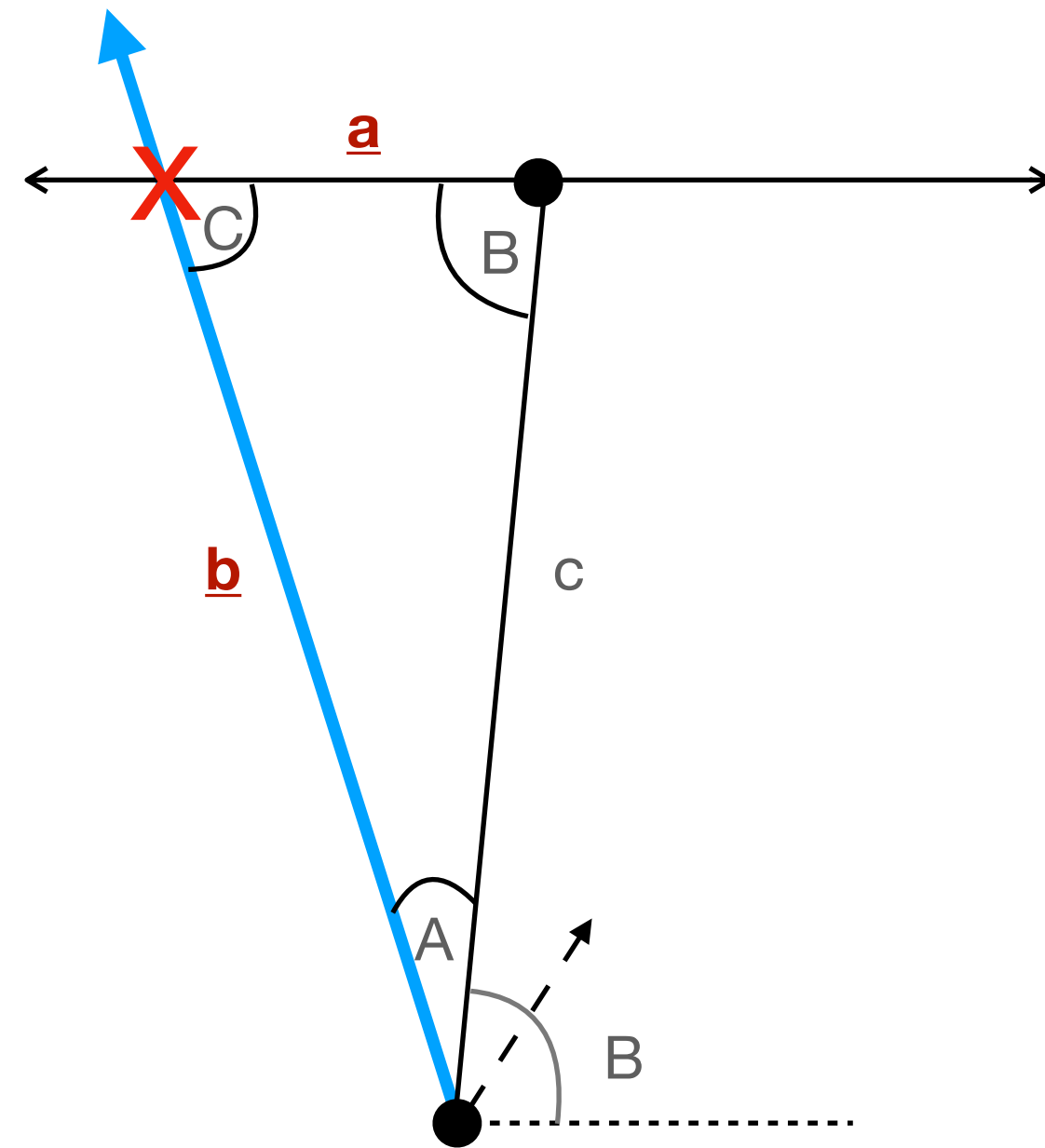
WALL RENDERING



Project cylinder onto flat sheet to correct “fish eye” effect

projected distance = ray hit distance * cos(cast angle)

SPRITE RENDERING



LAW OF SINES

Formula

$$\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$$

A = angle A

a = length of side a

B = angle B

b = length of side b

C = angle C

c = length side c

SIDES:

a = relative texture coordinate

b = ray length to sprite intersection

c = distance from camera to sprite (known)

ANGLES:

A = ray angle - angle of sprite to camera

B = angle of sprite to camera - sprite orientation

$C = 180 - A - B$

Example (in degrees):

ray angle (camera angle + cast angle) = 250

angle sprite to cam = 275

sprite orientation = 0

$A = -25$

$B = 275 - (0) = 275$

$C = 180 + 25 - 275 = -70$

due to negative angles, equivalent triangle is:

$A = 25$, $B = 85$, $C = 70$

solve for texture coords and ray hit distance:

$a = \sin(A) * c / \sin(C)$

$b = \sin(B) * c / \sin(C)$

