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Nombre del trabajo: ESTÁTICA PARA LA ARQUITECTURA

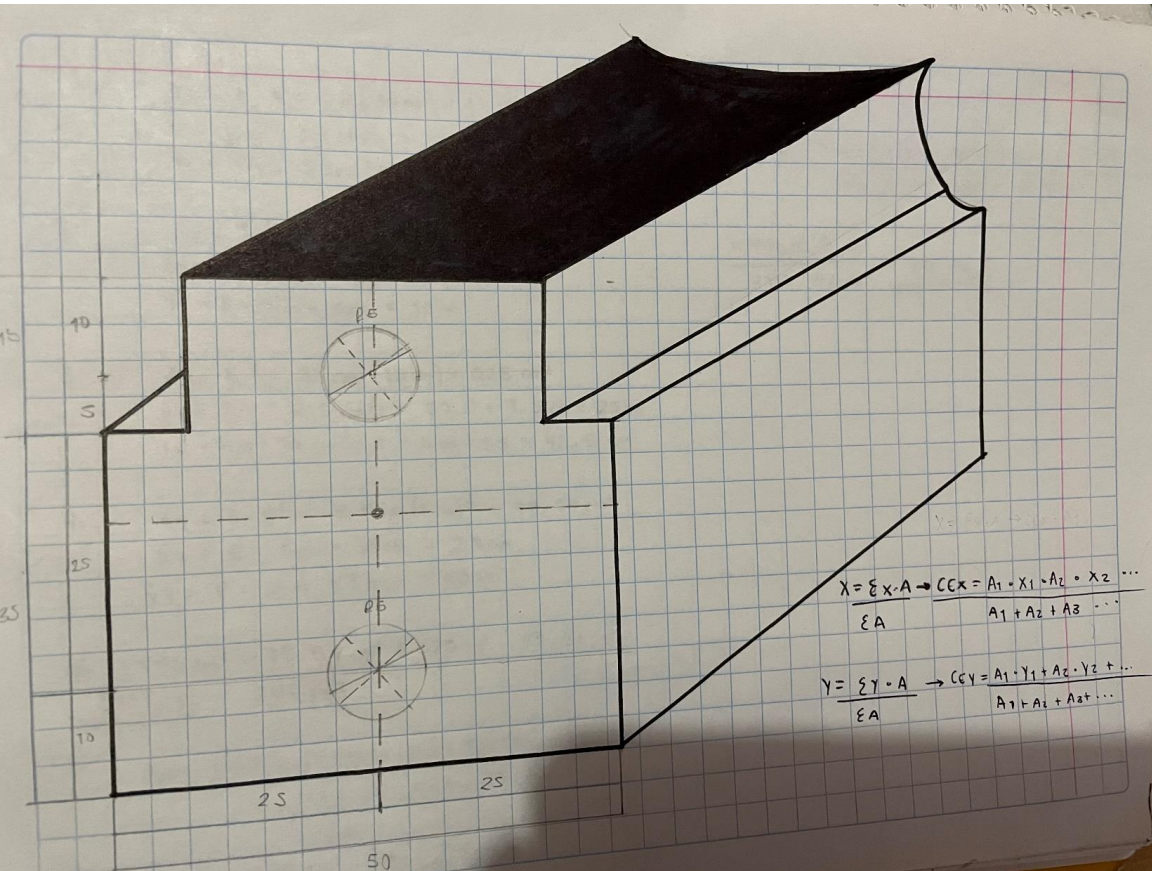
Materia: ESTÁTICA PARA LA ARQUITECTURA

Grado: 3

Grupo: A

ARQUITECTURA

PASIÓN POR EDUCAR



1.. $A_1 = b \cdot h = 50(35 \text{ cm}) = 1750 \text{ cm}^2$
 $\bar{x}_1 = b/2 = 50 \text{ cm}/2 = 25 \text{ cm}$
 $\bar{y}_1 = h/2 = 35 \text{ cm}/2 = 17.5 \text{ cm}$

2.. $A_2 = \pi \cdot r^2 = 3.1416(5)^2 = 78.54 \text{ cm}^2$
 $\bar{x}_2 = r = 5 \text{ cm} + 20 \text{ cm} = 25 \text{ cm}$
 $\bar{y}_2 = r = 5 \text{ cm} + 6 \text{ cm} = 10 \text{ cm}$

3.. $A_3 = b \cdot h = 35 \text{ cm}(15 \text{ cm}) = 525 \text{ cm}^2$
 $\bar{x}_3 = b/2 = 35 \text{ cm}/2 = 17.5 + 7.5 \text{ cm} = 25 \text{ cm}$
 $\bar{y}_3 = h/2 = 15 \text{ cm}/2 = 7.5 \text{ cm} + 35 = 42.5 \text{ cm}$

4.. $A_4 = \pi \cdot r^2 = 3.1416(5 \text{ cm})^2 = 78.54 \text{ cm}^2$
 $\bar{x}_4 = r = 5 \text{ cm} + 20 \text{ cm} = 25 \text{ cm}$
 $\bar{y}_4 = r = 5 \text{ cm} + 35 \text{ cm} = 40 \text{ cm}$

$A_{tc} = 1750 \text{ cm}^2 - 78.54 \text{ cm}^2 + 525 \text{ cm}^2 - 78.54 \text{ cm}^2$
 $\underline{2117.92} = 2118 \text{ cm}^2$

$Cgx = \frac{1750(25) - 78.54(25) + 525(25) - 78.54(25)}{1750 - 78.54 + 525 - 78.54}$
 $= \frac{52,948 \text{ cm}^3}{2117.92 \text{ cm}^2} = \underline{25 \text{ cm}}$

$Cgy = \frac{1750(17.5) - 78.54(10) + 525(42.5) - 78.54(40)}{1750 - 78.54 + 525 - 78.54}$
 $= \frac{49010.5 \text{ cm}^3}{2117.92 \text{ cm}^2} = \underline{23.14 \text{ cm}}$

$$\bar{x} = \frac{\sum x A}{\sum A} \rightarrow c_{ex} = \frac{A_1 \cdot \bar{x}_1 + A_2 \cdot \bar{x}_2 + A_3 \cdot \bar{x}_3 \dots}{A_1 + A_2 + A_3 + \dots}$$

$$\bar{y} = \frac{\sum y A}{\sum A} \rightarrow c_{ey} = \frac{A_1 \cdot \bar{y}_1 + A_2 \cdot \bar{y}_2 + A_3 \cdot \bar{y}_3 \dots}{A_1 + A_2 + A_3 + \dots}$$

1. $A_1 = b \cdot h = 40 \text{ cm} (20 \text{ cm}) = 800 \text{ cm}^2$
 $\bar{x}_1 = b/2 = 40/2 = 20 \text{ cm}$
 $\bar{y}_1 = h/2 = 20/2 = 10 \text{ cm}$

2. $A_2 = b \cdot h = 17 \text{ cm} (16 \text{ cm}) = 272 \text{ cm}^2$
 $\bar{x}_2 = b/2 = 17 \text{ cm}/2 = 8.5 \text{ cm} + 2 = 10.5 \text{ cm}$
 $\bar{y}_2 = h/2 = 16 \text{ cm}/2 = 8 \text{ cm} + 2 = 10 \text{ cm}$

3. $A_3 = b \cdot h = 17 \text{ cm} (16 \text{ cm}) = 272 \text{ cm}^2$
 $\bar{x}_3 = b/2 = 17/2 = 8.5 + 21 \text{ cm} = 29.5 \text{ cm}$
 $\bar{y}_3 = h/2 = 16/2 = 8 \text{ cm} + 2 = 10 \text{ cm}$

$A_{fc} = 800 \text{ cm}^2 - 272 \text{ cm}^2 = 800 \text{ cm}^2 - 544 \text{ cm}^2 = 256 \text{ cm}^2$

$$c_{gx} = \frac{800 \text{ cm}^2 (20 \text{ cm}) - 272 \text{ cm}^2 (10.5 \text{ cm}) - 272 \text{ cm}^2 (29.5 \text{ cm})}{800 \text{ cm}^2 - 272 \text{ cm}^2 - 272 \text{ cm}^2}$$

$$= \frac{5120 \text{ cm}^3}{256 \text{ cm}^2} = 20 \text{ cm}$$

$$c_{gy} = \frac{800 \text{ cm}^2 (10 \text{ cm}) - 272 \text{ cm}^2 (10 \text{ cm}) - 272 \text{ cm}^2 (10 \text{ cm})}{800 \text{ cm}^2 - 272 \text{ cm}^2 - 272 \text{ cm}^2}$$

$$= \frac{2560 \text{ cm}^3}{256 \text{ cm}^2} = 10 \text{ cm}$$

$$\bar{x} = \frac{\sum x A}{\sum A} \rightarrow c_{ex} = \frac{A_1 \cdot \bar{x}_1 + A_2 \cdot \bar{x}_2 + \dots}{A_1 + A_2 + A_3 \dots}$$

$$\bar{y} = \frac{\sum y A}{\sum A} \rightarrow c_{ey} = \frac{A_1 \cdot \bar{y}_1 + A_2 \cdot \bar{y}_2 + A_3 \cdot \bar{y}_3 \dots}{A_1 + A_2 + A_3 \dots}$$

1. $A_1 = b \cdot h = 10 \text{ cm} (20 \text{ cm}) = 200 \text{ cm}^2$
 $\bar{x}_1 = b/2 = 10 \text{ cm}/2 = 5 \text{ cm}$
 $\bar{y}_1 = h/2 = 20 \text{ cm}/2 = 10 + 30 \text{ cm} = 40 \text{ cm}$

2. $A_2 = \frac{\pi r^2}{4} = \frac{3.1416 (30)^2}{4} = 1413.72 \text{ cm}^2$
 $\bar{x}_2 = \frac{4r}{3\pi} = \frac{120}{9.4248} = 12.73 \text{ cm} + 10 = 22.73 \text{ cm}$
 $\bar{y}_2 = r = 30 \text{ cm}$

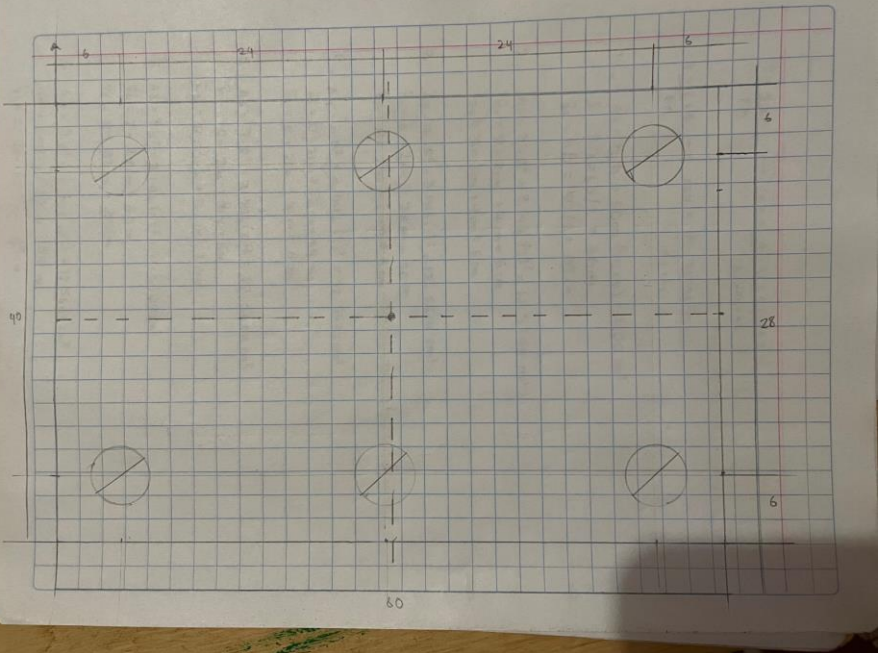
$A_{fc} = 200 \text{ cm}^2 + 1413.72 \text{ cm}^2 = 1613.72 \text{ cm}^2$

$$c_{gx} = \frac{200 \text{ cm}^2 (5 \text{ cm}) + 1413.72 \text{ cm}^2 (22.73 \text{ cm})}{200 \text{ cm}^2 + 1413.72 \text{ cm}^2}$$

$$= \frac{33133.8556 \text{ cm}^3}{1613.72 \text{ cm}^2} = 20.53 \text{ cm}$$

$$c_{gy} = \frac{200 \text{ cm}^2 (40 \text{ cm}) + 1413.72 \text{ cm}^2 (30 \text{ cm})}{200 \text{ cm}^2 + 1413.72 \text{ cm}^2}$$

$$= \frac{50411.6 \text{ cm}^3}{1613.72 \text{ cm}^2} = 31.23 \text{ cm}$$



$$\bar{X} = \frac{\sum XA}{\sum A} \rightarrow C_{GX} = \frac{A_1 \cdot \bar{x}_1 + A_2 \cdot \bar{x}_2 + \dots}{A_1 + A_2 + A_3 \dots}$$

$$\bar{Y} = \frac{\sum YA}{\sum A} \rightarrow C_{GY} = \frac{A_1 \cdot \bar{y}_1 + A_2 \cdot \bar{y}_2 + \dots}{A_1 + A_2 + \dots}$$

$$1.. A_1 = b \cdot h = 60 \text{ cm} (40 \text{ cm}) = 2400 \text{ cm}^2$$

$$\bar{x}_1 = b/2 = 60/2 = 30 \text{ cm}$$

$$\bar{y}_1 = h/2 = 40/2 = 20 \text{ cm}$$

$$2.. A_2 = \pi \cdot r^2 = 3.1416 (2)^2 = 12.5664 \text{ cm}^2$$

$$\bar{x}_2 = r = 2 \text{ cm} + 4 \text{ cm} = 6 \text{ cm}$$

$$\bar{y}_2 = r = 2 \text{ cm} + 4 \text{ cm} = 6 \text{ cm}$$

$$3.. A_3 = \pi \cdot r^2 = 3.1416 (2)^2 = 12.5664 \text{ cm}^2$$

$$\bar{x}_3 = r = 2 \text{ cm} + 28 \text{ cm} = 30 \text{ cm}$$

$$\bar{y}_3 = r = 2 \text{ cm} + 4 \text{ cm} = 6 \text{ cm}$$

$$4.. A_4 = \pi \cdot r^2 = 3.1416 (2)^2 = 12.5664 \text{ cm}^2$$

$$\bar{x}_4 = r = 2 \text{ cm} + 52 \text{ cm} = 54 \text{ cm}$$

$$\bar{y}_4 = r = 2 \text{ cm} + 4 \text{ cm} = 6 \text{ cm}$$

$$5.. A_5 = \pi \cdot r^2 = 3.1416 (2)^2 = 12.5664 \text{ cm}^2$$

$$\bar{x}_5 = r = 2 \text{ cm} + 4 \text{ cm} = 6 \text{ cm}$$

$$\bar{y}_5 = r = 2 \text{ cm} + 32 \text{ cm} = 34 \text{ cm}$$

$$6.. A_6 = \pi \cdot r^2 = 3.1416 (2)^2 = 12.5664 \text{ cm}^2$$

$$\bar{x}_6 = 2 + 28 \text{ cm} = 30 \text{ cm}$$

$$\bar{y}_6 = r + 32 \text{ cm} = 34 \text{ cm}$$

$$7.. A_7 = \pi \cdot r^2 = 3.1416 (2)^2 = 12.5664 \text{ cm}^2$$

$$\bar{x}_7 = r = 2 \text{ cm} + 52 \text{ cm} = 54 \text{ cm}$$

$$\bar{y}_7 = r = 2 \text{ cm} + 32 \text{ cm} = 34 \text{ cm}$$

$$A_{fc} = 2400 - 12.5664 - 12.5664 - 12.5664 - 12.5664 - 12.5664 - 12.5664$$

$$= 2324.6016 \text{ cm}^2$$

$$C_{GX} = 2400(30) - 12.5664(6) - 12.5664(30) - 12.5664(54) - 12.5664(6) - 12.5664(30) - 12.5664(54)$$

$$\frac{2400 - 12.5664 - 12.5664 - 12.5664 - 12.5664 - 12.5664 - 12.5664}{2324.6016 \text{ cm}^2} = 30 \text{ cm}$$

$$C_{GY} = 2400(70) - 12.5664(6) - 12.5664(6) - 12.5664(6) - 12.5664(34) - 12.5664(34) - 12.5664(34)$$

$$\frac{2400 - 12.5664 - 12.5664 - 12.5664 - 12.5664 - 12.5664 - 12.5664}{2324.6016 \text{ cm}^2} = 20 \text{ cm}$$