3. Express the following angles into sexagesimal seconds;

i) 20°

$\Rightarrow$ Soln

Here,

$20^\circ = (20^\circ \times 60 \times 60)''$

$= (1200 \times 60)''$

$\therefore 20^\circ = 72000''$

60
×20
00
120×
1200

ii) 65°

DATE
PAGE No.

→ Soln;

Here,

$65° = (65 \times 60 \times 60)''$

$\therefore 65° = 234000''$

iii) $70°$

→ Soln;

Here,

$70° = (70 \times 60 \times 60)''$

$\therefore 70° = 252000''$

iv) $10^{\circ}40'$

-> Soln,

Here,

$$10^{\circ}40' = (10\times60+40)'$$
$$= (600+40)'$$
$$= 640'$$

Now,

$$640' = [640\times60]''$$
$$= 38400''$$

$\therefore 10^{\circ}40' = 38400''$

---

4) Express the following angles into centisimal seconds;

i) 16^{g}

-> Soln,

Here,

$$16^{g} = [16\times100\times100]''$$
$$\therefore 16^{g} = 160000''$$

ii) 42^g

→ Soln,

Here,

$42^g = [42 \times 100 \times 100]''$

$\therefore 42^g = 420000''$

---

iii) 50^g

→ Soln,

Here,

$50^g = [50 \times 100 \times 100]''$

$\therefore 50^g = 500000''$

---

iv) $80^g 80'$

→ Soln,

Here,

$80^g 80' = [80 \times 100 + 80]'$

$= [8000 + 80]'$

$= 8080'$

Now,

$8080' = [8080 \times 100]'' = 808000''$

$\therefore 80^g 80' = 808000''$

5) Express the following sexagesimal seconds into degree;

i) 43200"

→ Soln,

Here,

$$43200'' = \left[\frac{43200}{60\times60}\right]^{\circ}$$

$$\therefore 43200'' = 12^{\circ}$$

---

ii) 126000"

→ Soln,

Here,

$$126000'' = \left[\frac{126000}{60\times60}\right]^{6}$$

$$\therefore 126000'' = 35^{\circ}$$

---

iii) 201600"

→ Soln,

Here,

$$201600'' = \left[\frac{201600}{60\times60}\right]''$$

$\therefore 201600'' = 56^\circ$

iv) $91800''$

→ Soln,

Here,

$$91800'' = \left[\frac{91800}{60 \times 60}\right]^\circ$$

$$\therefore 91800'' = 25.5^\circ$$

6) Express the following centisimal seconds into grade:

i) 180000^c

→ Soln,

Here,

$$180000'' = \left[\frac{180000}{100 \times 100}\right]^g$$

$$\therefore 180000'' = 18^g$$

ii) $460000''$

→ Soln,

Here, $460000'' = \left[\frac{460000}{100 \times 100}\right]^g$

$\therefore 460000'' = 46^g$

---

iii) $720000''$

→ Soln,

Here,

$$720000'' = \left[\frac{720000}{100 \times 100}\right]^g$$

$\therefore 720000'' = 72^g$

---

iv) $335600''$

→ Soln,

Here,

$$335600'' = \left[\frac{335600}{100 \times 100}\right]^g$$

$\therefore 335600'' = 33.56^g$

7(i) Express an angle of a square

into grade.

→ Soln,

Here,

Angle of a square = 90°

We have,

$$1^\circ = \left[\frac{10}{9}\right]^g$$

or, $$90^\circ = \left[\frac{10}{9_1} \times \overset{10}{\cancel{90}}\right]^g$$

$$\therefore 90^\circ = [100]^g$$

$\therefore$ Angle of square in grade = 100^g

7(ii) Express an angle of an equilateral triangle into grade.

→ Soln,

Here,

Angle of an equilateral triangle = 60°

We have,

$$1^\circ = \left[\frac{10}{9}\right]^g$$

$$\text{or, } 60^\circ = \left[\frac{10}{9_3} \times \cancel{60}^{20}\right]^g$$

$$\therefore 60^\circ = \left[\frac{200}{3}\right]^g$$

$\therefore$ Angle of an equilateral triangle $= \left[\frac{200}{3}\right]^g$.