SOLUTIONS

(1.) $T = \{tw\}$ minimum weight edge

$T = \{tw, wy\}$ minimum weight edge incident with T

$T = \{tw, wy, tv\}$

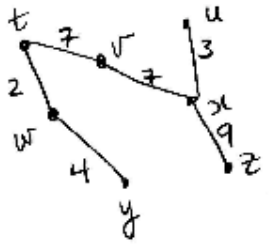
$T = \{tw, wy, tv, vx\}$

$T = \{tw, wy, tv, vx, ux\}$

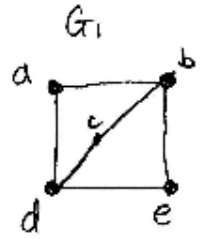
$T = \{tw, wy, tv, vx, ux, xz\}$

Minimum weight is 32.

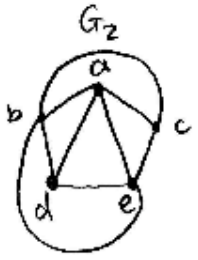
T:

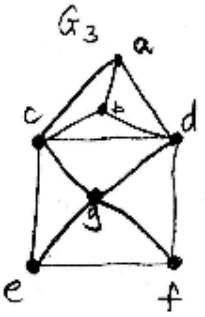


(2.)



No edges crossing ✓





(3) Euler's Formula

$V = 10 \quad E = 17 \quad F = 9$

$\boxed{V - E + F = 2}$ ✓

The Edge Formula

$F_2 = 0 \quad F_3 = 5 \quad F_4 = 1 \quad F_5 = 3 \quad F_i = 0$ for $i \geq 6$.

↑ include the infinite region!

$$2F_2 + 3F_3 + 4F_4 + 5F_5 + \ldots = 2(0) + 3(5) + 4(1) + 5(3)$$
$$= 34$$
$$= 2E$$

$\boxed{2F_2 + 3F_3 + 4F_4 + 5F_5 + \ldots = 2E}$ ✓

(4) G_1: two vertices of odd degree.
An Euler trail is cabcdefd ← passes through each edge exactly once

G_2: All vertices have even degree.
An Euler circuit is abcdeadbeca

G_3: Degrees are 2, 3, 3, 4, 1, 3
Neither. Too many vertices of odd degree.

G_4: two vertices of odd degree
An Euler trail is bfdabcedc

(5)

G_1: No Hamilton cycle.
A Hamilton path is
zyxuvw ← passes through each vertex exactly once

G_2: No Hamilton cycle or Hamilton path.

G_3: Hamilton cycle. Trace out the star.
jgkhij.