EXERCISE SOLUTIONS

Part 1: Solve for the unknown variable

1. a) $D = \sqrt{(2-5)^2 + (6-5)^2}$
   $= \sqrt{(-3)^2 + (1)^2}$
   $= \sqrt{9+1}$
   $= \sqrt{10}$
   $D = 3.162$

b) $D = \sqrt{(2-4)^2 + (5-4)^2}$
   $= \sqrt{(-2)^2 + (1)^2}$
   $= \sqrt{4+1}$
   $= \sqrt{5}$
   $D = 2.236$

2. a) $D_{nose} = (0.45)(5)$
   $= 2.25$ units from baseline
   $D_{eyebrows} = (0.25)(5)$
   $= 1.25$ units from baseline
   $D_{mouth} = (1.2)(5)$
   $= 6$ units from baseline.

b) $D_{nose} = (0.5)(3.9)$
   $= 1.95$ units from baseline
   $D_{eyebrows} = (0.33)(3.9)$
   $= 1.29$ units from baseline
   $D_{mouth} = (0.9)(3.9)$
   $= 3.51$ units from baseline

3. a) $D_{nose} = (x)(D)$
   $\dfrac{1.68}{4} = \dfrac{4x}{4}$
   $x = 0.42$
   $D_{nose} = 0.42D$

b) $D_{eyebrow} = (x)(D)$
   $\dfrac{0.75}{3.5} = \dfrac{3.5x}{3.5}$
   $x = 0.21$
   $D_{eyebrow} = 0.21 D$

Part 2: Measure the length of the facial candidate from the baseline and solve

a) $D = 4$

Deyebrow $= xD$
   $0.8 = 4x$
   $x = 0.2$
   $\boxed{D_{eyebrow} = 0.2D}$

$D_{nose} = xD$
   $1.9 = 4x$
   $x = 0.475$
   $\boxed{D_{nose} = 0.475D}$

$D_{mouth} = xD$
   $3.2 = 4x$
   $x = 0.8$
   $\boxed{D_{mouth} = 0.8D}$

b) Solve for D, given coordinates of eye₁ and eye₂

$D = \sqrt{(1-3)^2 + (3-6)^2}$
   $= \sqrt{(-2)^2 + (-3)^2}$
   $= \sqrt{4+9}$
   $= \sqrt{13}$
   $\boxed{D = 3.6}$
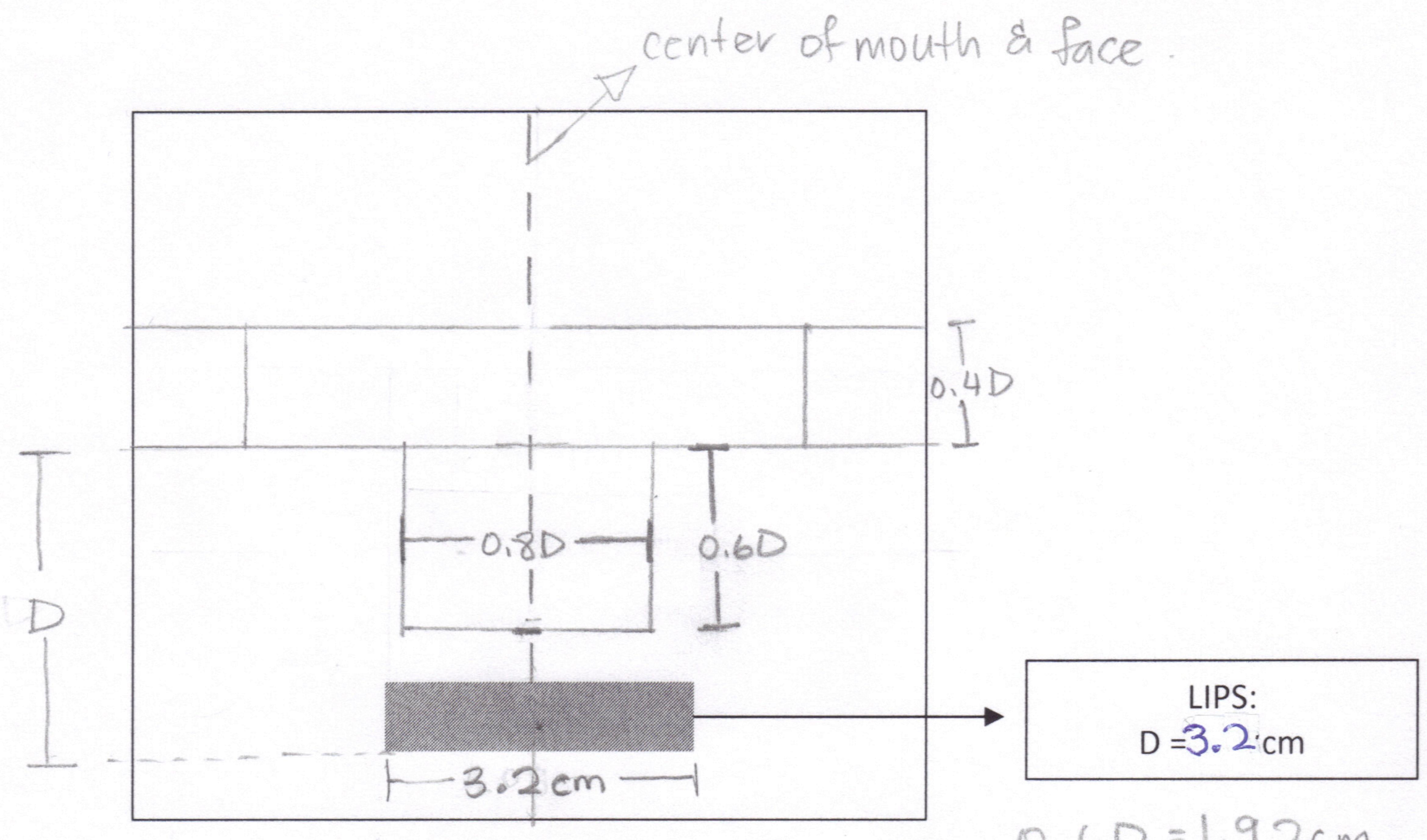
$D_{nose} = xD$
   $1.7 = 3.6x$
   $x = 0.47$
   $\boxed{D_{nose} = 0.47D}$

$D_{eyebrows} = xD$
   $0.6 = 3.6x$
   $x = 0.17$
   $\boxed{D_{eyebrows} = 0.17D}$

$D_{mouth} = xD$
   $3.5 = 3.6x$
   $x = 0.97$
   $\boxed{D_{mouth} = 0.97D}$

center of mouth & face

0.4D

D

0.8D

0.6D

3.2 cm

LIPS:
D = 3.2 cm

0.6D = 1.92 cm
0.8D = 2.56 cm
0.4D = 1.28 cm