1. $a = 10$, $b = 26$

$c^2 = b^2 - a^2$
$c^2 = 676 - 100$
$c^2 = 576$
$c = 24$

$F_1 = (0, 24)$ $F_2 (0, -24)$

The buoys are 48m apart.

2. $\frac{x^2}{289} + \frac{y^2}{196} = 1$

let $y = 12$

$\frac{x^2}{289} + \frac{144}{196} = 1$

$\frac{x^2}{289} = 1 - \frac{144}{196}$

$\frac{x^2}{289} = \frac{196}{196} - \frac{144}{196}$

$\frac{x^2}{289} = \frac{52}{196}$

$x^2 = \frac{15028}{196}$

$x^2 \approx 76.67$

$x \approx \pm 8.76$

$m\overline{AB} = 2(8.76) = 17.51$ cm

3. circle: $x^2 + y^2 = 16$ $r = 4$

$F_1 (-4, 0)$ $F_2 (4, 0)$ $c = 4$, $b = 4$

$c^2 = a^2 - b^2$
$4^2 = a^2 - 4^2$
$16 = a^2 - 16$
$32 = a^2$

$a = \sqrt{32} = 4\sqrt{2} \Rightarrow (-4\sqrt{2}, 0)$ and $(4\sqrt{2}, 0)$

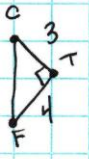
Length of major axis $= 2(4\sqrt{2})$
$= 8\sqrt{2}$

4. major axis = 20 $\Rightarrow$ $a = 10$
minor axis = 12 $\Rightarrow$ $b = 6$

equation : $\frac{x^2}{100} + \frac{y^2}{36} = 1$

5. $a = 25$
$b = 20$

$c^2 = a^2 - b^2$
$c^2 = 625 - 400$
$c^2 = 225$
$c = \pm 15$



$d(C,F) = 5m$

$\therefore$ centre $(15, 5)$

equation of circle: $(x-15)^2 + (y-5)^2 = 9$