

is the midpt of the hypotenuse BC

$$\begin{aligned} \text{then } x_I &= \frac{x_B + x_C}{2} & y_I &= \frac{y_B + y_C}{2} \\ &= \frac{2+0}{2} & &= \frac{3-3}{2} \\ x_I &= 1 & y_I &= 0 \\ \text{Thus, } & \boxed{I(1, 0)} \end{aligned}$$

Radius of (c) is

$$r = \frac{BC}{2}$$

$$\begin{aligned} BC &= \sqrt{(x_B - x_C)^2 + (y_B - y_C)^2} \\ &= \sqrt{2^2 + 6^2} \\ &= \sqrt{40} = 2\sqrt{10} \end{aligned}$$

$$\text{Thus, } \boxed{r = \sqrt{10} \text{ cm.}}$$

$$\begin{aligned} 37. a) (3 - \sqrt{10})^2 &= 3^2 - 2(\sqrt{10})(3) + (\sqrt{10})^2 \\ &= 9 - 6\sqrt{10} + 10 \\ &= 19 - 6\sqrt{10}. \end{aligned}$$

$$\begin{aligned} IF &= \sqrt{19 - 6\sqrt{10}} \\ &= \sqrt{(3 - \sqrt{10})^2} \text{ but } 3 - \sqrt{10} < 0 \end{aligned}$$

$$\text{Thus, } IF = \text{opp}(3 - \sqrt{10})$$

$$\boxed{IF = (\sqrt{10} - 3) \text{ cm}}$$

b) To determine relative position of F w.r.t. (c)

$$\begin{aligned} \text{we find } IF - r &= (\sqrt{10} - 3) - \sqrt{10} \\ &= -3 \end{aligned}$$

So, $IF - r < 0$.

hence $IF < r$

Thus, $\boxed{F \text{ is inside } (c)}$

$$\begin{aligned} \text{Ex-3. (1)} \quad p(x) &= (x+1)(x+2)(x-3) + 3(x+2) \\ &= (x+2)[(x+1)(x-3) + 3] \\ &= (x+2)[x^2 - 2x - 3 + 3] \\ &= (x+2)(x^2 - 2x) \end{aligned}$$

$$\text{Thus, } \boxed{p(x) = x(x+2)(x-2)}$$

$$\begin{aligned} 2a) \quad A(x) &= p(x) - E(x) \\ &= x(x+2)(x-2) - (x-2)(2x+4) \\ &= x(x+2)(x-2) - 2(x-2)(2+x) \\ &= (x-2)(x+2)[x-2] \end{aligned}$$

$$\text{Thus, } \boxed{A(x) = (x+2)(x-2)^2}$$

$$b) \quad A(x) = 0$$

$$(x+2)(x-2)^2 = 0$$

$$\text{So, } x = -2 \text{ or } x = 2.$$