$restart : with(VectorCalculus) : BasisFormat(false) : with(plots) :$

$\alpha := \frac{2 \cdot \pi}{3}$: *#angle dividing arcs in ratio 1:2*

 # here are unit vectors parallel and perpendicular to the line 4x+3y=4

$mhat := \frac{1}{5} \cdot \langle -3|4 \rangle :$

$nhat := \frac{1}{5} \cdot \langle 4|3 \rangle :$

$ctr := \langle 5|3 \rangle :$ *#center of circle*

$L := ctr - t \cdot nhat;$ *#parametric equation of perpendicular line*

$$\left[5 - \frac{4}{5}\, t \quad 3 - \frac{3}{5}\, t \right] \tag{1}$$

$tvalue := solve(4 \cdot L[1] + 3 \cdot L[2] = 4, t) :$ *#value of t where normal line hits the given line*

$radius := 2 \cdot tvalue;$ *#because of 30-60-90 triangle*

$a := \frac{radius}{2} \cdot \sqrt{3} :$ *#a is the length of half the chord*

$ip := subs(t = tvalue, L);$ *#point of intersection with normal line*

$$10$$

$$\left[1 \quad 0 \right] \tag{2}$$

$p1 := ip + a \cdot mhat; p2 := ip - a \cdot mhat;$ *#these are position vectors for the two points*

$$\left[1 - 3\sqrt{3} \quad 4\sqrt{3} \right]$$

$$\left[1 + 3\sqrt{3} \quad -4\sqrt{3} \right] \tag{3}$$

$Norm(ctr - p1, 2);$ *#these check that p1 and p2 are on the line and distance 10 from the center*

$Norm(ctr - p2, 2);$

$4 \cdot p1[1] + 3 \cdot p1[2];$

$4 \cdot p2[1] + 3 \cdot p2[2];$

$$10$$

$$10$$

$$4$$

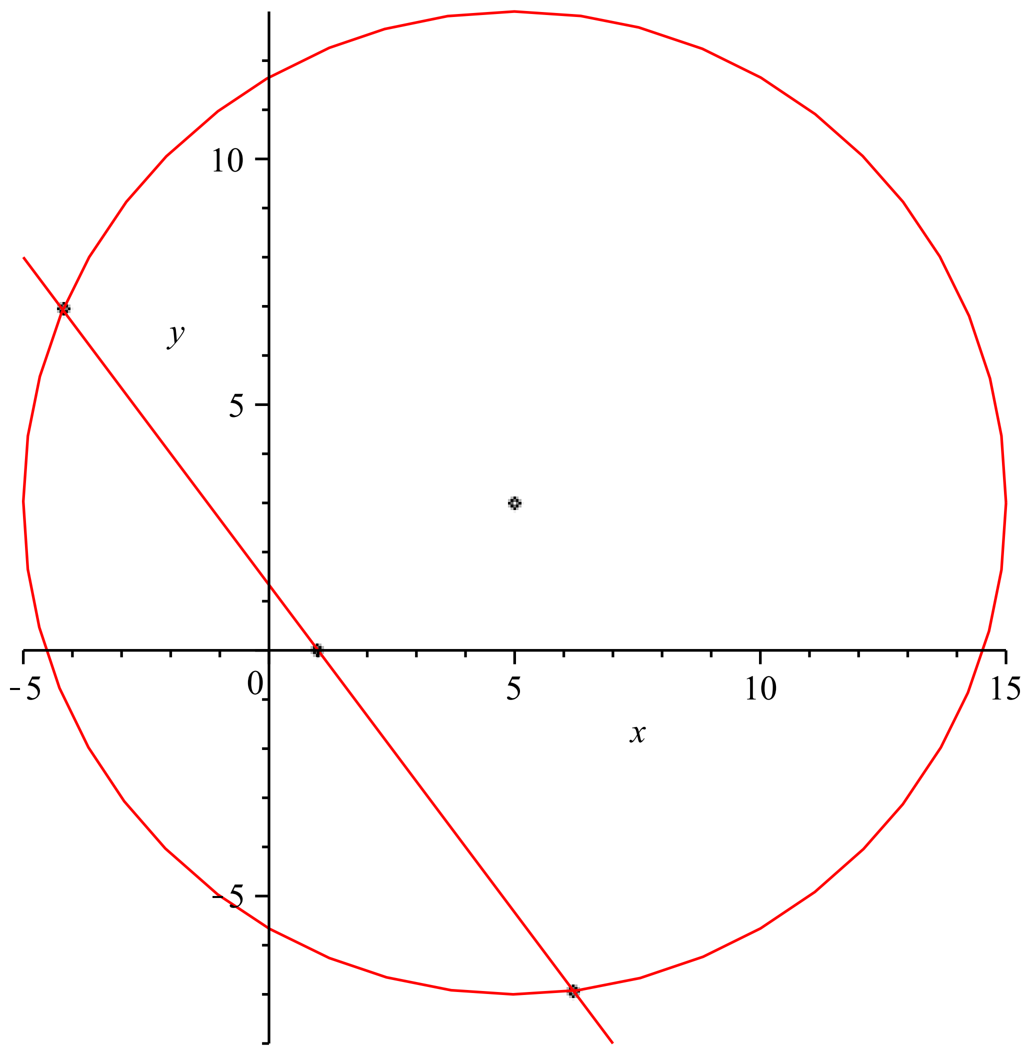
$$4 \tag{4}$$

$circle := plot([5 + radius \cdot \cos(t), 3 + radius \cdot \sin(t), t = 0..2 \cdot \pi]) :$

$line := implicitplot(4 \cdot x + 3 \cdot y = 4, x = -5..7, y = -10..10) :$

$points := pointplot(\langle ctr|p1|p2|ip \rangle) :$

$display(\{circle, line, points\}, scaling = constrained);$



y
10
5
-5
-5
0
5
10
15
x