

Feuille de travail RAS 3,5 #1 eq:

e) ① $y = \frac{1}{4}x^2 + 2$

② → ①

$-\frac{3x}{2} = \frac{1}{4}x^2 + 2$

② $3x + 2y = 0$

$-6x = x^2 + 8$ $\frac{2+4}{2} = 6$
 $0 = x^2 + 6x + 8$ $\frac{2x+4}{2} = 8$

$2y = -3x$
 $y = -\frac{3}{2}x$

$0 = x^2 + 2x + 4x + 8$

$0 = (x+2)(x+4)$

$x = -2$ $x = -4$ $\boxed{(-2, 3) \quad (-4, 6)}$

$y = 3$ $y = 6$

✓ g) $y = 3x^2 + 2x$
 $y = 2x + 7$

✓ i) $y = -x^2 + 6x$ → j

$y = 2x + 3$

$2x + 3 = -x^2 + 6x$

$2x + 7 = 3x^2 + 2x$

$x^2 - 4x + 3 = 0$

$0 = 3x^2 - 7$

$(x-1)(x-3) = 0$

$\frac{2 \pm 1}{2}$

$3x^2 = 7$

$x = 1$ $x = 3$ $(1, 5) \quad (3, 9)$

$x^2 = \frac{7}{3}$

$y = 5$ $y = 9$

$x = \frac{\pm \sqrt{7 \pm 21}}{3} \rightarrow \left(\frac{\sqrt{21}}{3}, \frac{2\sqrt{21}+7}{3} \right)$ et $\left(\frac{-\sqrt{21}}{3}, \frac{-2\sqrt{21}+7}{3} \right)$

Omnimath II p. 488 #4, 8, 11, 22 et 25

14. $x - y = 10$
 $x = y + 10$

$x^2 + y^2 = 10$

$(y+10)^2 + y^2 = 10$

$y^2 + 20y + 100 + y^2 = 10$

$2y^2 + 20y + 90 = 0$

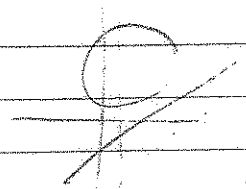
$y^2 + 10y + 45 = 0$

$y^2 + 10y + 25 - 25 + 45 = 0$

$(y+5)^2 + 20 = 0$

$(y+5)^2 = -20$

$y+5 = \pm \sqrt{-20} \rightarrow$ aucun point d'intersection



8.

$$x + 2y + 15 = 0$$

$$x^2 + y^2 = 90$$

$$x = -2y - 15$$

$$(-2y - 15)^2 + y^2 = 90$$

$$4y^2 + 60y + 225 + y^2 = 90$$

$$5y^2 + 60y + 135 = 0$$

$$y^2 + 12y + 27 = 0$$

$$(y+3)(y+9) = 0$$

$$y = -3 \quad y = -9$$

$$x = -2(-3) - 15 = -9 \rightarrow (-9, -3)$$

$$x = -2(-9) - 15 = 3 \rightarrow (-3, -9)$$

11.

$$y = x - 5$$

$$(x+3)^2 + (y+1)^2 = 16$$

$$(x+3)^2 + (x-5+1)^2 = 16$$

$$x^2 + 6x + 9 + (x-4)^2 = 16$$

$$x^2 + 6x + 9 + x^2 - 8x + 16 = 16$$

$$2x^2 - 2x + 9 = 0$$

$$x^2 - x + 4,5 = 0$$

$$x^2 - x + \frac{1}{4} - \frac{1}{4} + 4,5 = 0$$

$$\left(x - \frac{1}{2}\right)^2 - 0,25 + 4,5 = 0$$

$$\checkmark \left(x - \frac{1}{2}\right)^2 = -4,25$$

$$\sqrt{\left(x - \frac{1}{2}\right)^2} = \sqrt{-4,25} \rightarrow \text{Aucun point d'intersection.}$$

22. $y = 0,5x + 2$

$g = (x+1)^2 + (y+1)^2$
 ① $g = (x+1)^2 + (0,5x+2+1)^2$

$g = x^2 + 2x + 1 + (0,5x + 3)^2$

$g = x^2 + 2x + 1 + 0,25x^2 + 3x + 9$

$0 = 1,25x^2 + 5x + 1$

$0 = x^2 + 4x + 0,8$

$0 = x^2 + 4x + 4 - 4 + 0,8$

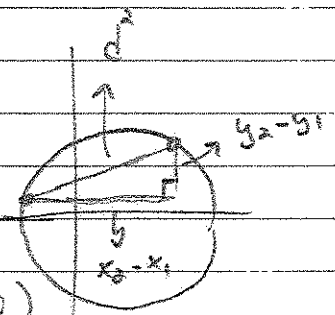
$0 = (x+2)^2 - 3,2$

$\pm \sqrt{3,2} = \sqrt{(x+2)^2}$

$\pm 1,79 = x + 2$

$-2 \pm 1,79 = x$

$x_1 = -0,21 \quad x_2 = -3,79$



③ $y_1 = 0,5(-0,21) + 2 = -1,90 \quad (-0,21; -1,90)$
 $y_2 = 0,5(-3,79) + 2 = 0,105 \quad (-3,79; 0,105)$

④ $d^2 = (x_2 - x_1)^2 + (y_2 - y_1)^2$
 $d^2 = (-3,79 + 0,21)^2 + (0,105 + 1,9)^2$
 $d^2 = 12,53 + 4,02$

$d = 4,07 \text{ cm}$

25. $(x-5)^2 + y^2 = 16 \quad y = 2 - x$

① $(x-5)^2 + (2-x)^2 = 16$

$x^2 - 10x + 25 + (4 - 4x + x^2) = 16$

$2x^2 - 14x + 29 - 16 = 0$

$2x^2 - 14x + 13 = 0 \quad -x = 26$

$2(x^2 - 7x + \frac{49}{4} - \frac{49}{4}) + 13 = 0 \quad -+ - = -14$

$2(x - \frac{7}{2})^2 - \frac{49}{2} + 13 = 0 \quad x = \frac{7}{2} \pm 2,40$

$2(x - \frac{7}{2})^2 = 11,5 \quad x_1 = 5,90 \quad x_2 = 1,10$

$(x - \frac{7}{2})^2 = 5,75 \quad y_1 = 2 - 5,90 = -3,90$
 $y_2 = 2 - 1,10 = 0,90$

$x - \frac{7}{2} = \pm 2,40 \quad (5,9; -3,9) \quad (1,1; 0,9) \quad \rightarrow \text{Vorne Verso}$

$$d^2 = (x_2 - x_1)^2 + (y_2 - y_1)^2$$

$$d^2 = (1,10 - 5,9)^2 + (0,9 - -3,9)^2$$

$$d^2 = 23,04 + 23,04$$

$$d = \pm \sqrt{46}$$

$$d = 6,79 = \boxed{6,8}$$

P. 488 431

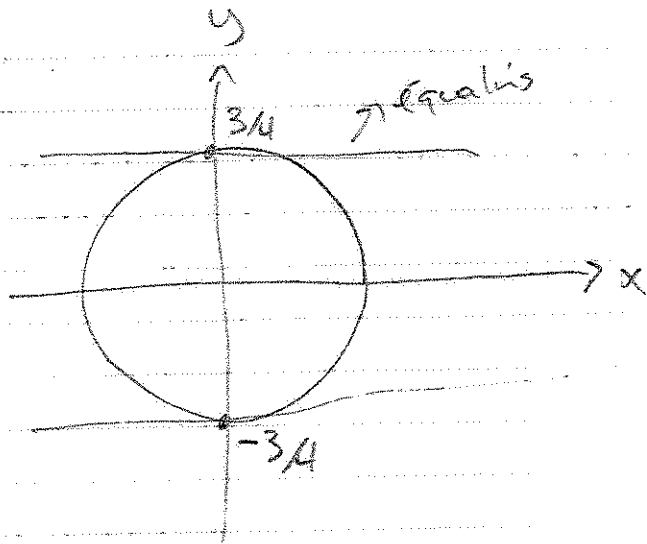
31. $x^2 + y^2 = \frac{9}{16}$

$x = 0$

$y^2 = \frac{9}{16}$

$y = \pm \frac{3}{4}$

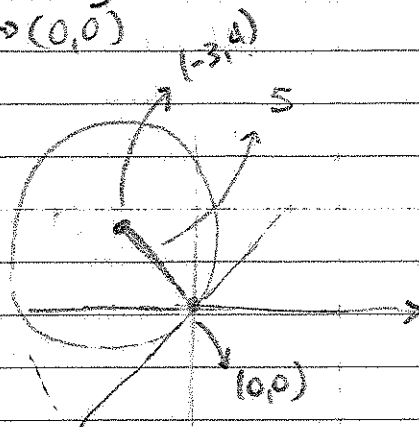
$y = \frac{3}{4}$ et $y = -\frac{3}{4}$



p. 488 731, 48 ab, 57, 60, 71, 73, 83, 90, 97 ab

Omnimath V

48. a) $(x+3)^2 + (y-4)^2 = 25 \rightarrow (0,0)$
 $(0+3)^2 + (0-4)^2 = 25$
 $9 + 16 = 25$
 $25 = 25 \checkmark$



b)

$$y = mx + b$$

$$y = mx$$

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m = \frac{4 - 0}{-3 - 0} = -\frac{4}{3}$$

$$m = \frac{3}{4}$$

✓

$$y = \frac{3}{4}x$$

57. $x^2 + y^2 = 16$ P(5,9)

$$d^2 = (x_2 - x_1)^2 + (y_2 - y_1)^2$$

$$d^2 = 5^2 + 9^2$$

$$d^2 = 106$$

① $d = \sqrt{106}$

② $a^2 + b^2 = c^2$

$$4^2 + b^2 = (\sqrt{106})^2$$

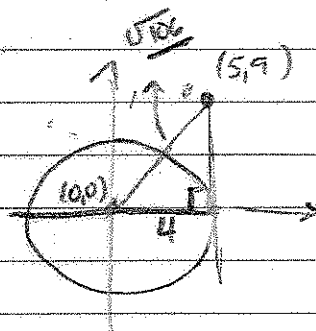
$$4^2 + b^2 = 106$$

$$b^2 = 106 - 16$$

$$b^2 = 90$$

$$b = \sqrt{90}$$

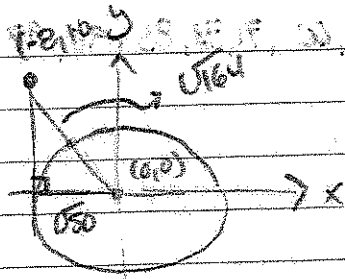
$$b = 3\sqrt{10}$$



60.

$$x^2 + y^2 = 50$$

$$P(-8, 10)$$



$$\textcircled{1} d^2 = (y_2 - y_1)^2 + (x_2 - x_1)^2$$

$$d^2 = 10^2 + (-8)^2$$

$$d^2 = 100 + 64$$

$$d^2 = 164$$

$$d = \sqrt{164}$$

$$\textcircled{2} a^2 + b^2 = c^2$$

$$(\sqrt{50})^2 + b^2 = (\sqrt{164})^2$$

$$50 + b^2 = 164$$

$$b^2 = 114$$

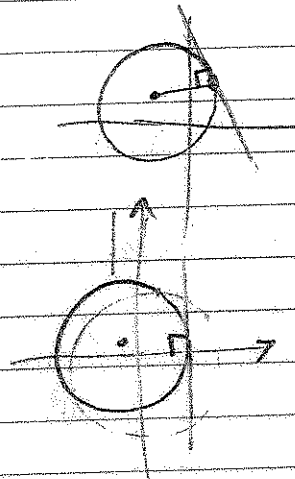
$$b = \sqrt{114}$$

$$71. (x+1)^2 + (y-1)^2 = 4 \quad \begin{matrix} x & y \\ (1, 1) \end{matrix}$$

$$C(-1, 1) \quad m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$(1, 1) \quad = \frac{0}{2} = 0$$

$$x = 1$$

73. m \overline{PQ} = ?

$$\textcircled{1} \begin{cases} x^2 + y^2 = 25 \\ y = 2x \end{cases}$$

$$x^2 + (2x)^2 = 25$$

$$x^2 + 4x^2 = 25$$

$$5x^2 = 25$$

$$x^2 = 5$$

$$x = \pm\sqrt{5}$$

$$x = +\sqrt{5}$$

$$y = 2\sqrt{5}$$

$$(\sqrt{5}, +2\sqrt{5})$$

$$\textcircled{2} \begin{cases} x^2 + y^2 = 25 \\ y = 0,5x \end{cases}$$

$$x^2 + (0,5x)^2 = 25$$

$$x^2 + 0,25x^2 = 25$$

$$1,25x^2 = 25$$

$$x^2 = 20$$

$$x = \pm\sqrt{20}$$

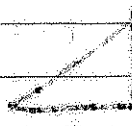
$$x = \pm 2\sqrt{5}$$

$$x = 2\sqrt{5}$$

$$y = 0,5(2\sqrt{5})$$

$$y = \sqrt{5}$$

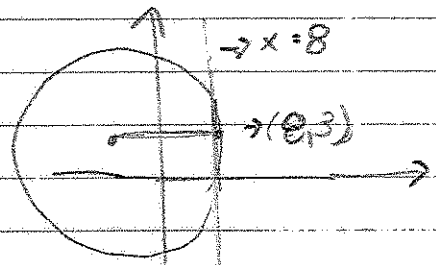
$$(2\sqrt{5}, \sqrt{5})$$

$$\begin{aligned}
 \overline{MN}^2 &= (y_2 - y_1)^2 + (x_2 - x_1)^2 \\
 &= (2\sqrt{5} - \sqrt{5})^2 + (\sqrt{5} - 2\sqrt{5})^2 \\
 &= (\sqrt{5})^2 + (-\sqrt{5})^2 \\
 &= 5 + 5 \\
 \overline{MN} &= 10 \\
 \overline{MN} &= \boxed{\sqrt{10}}
 \end{aligned}$$


83. $x = 8$ $C(-1, 3)$

$$r = 8 - (-1) = 9$$

$$\begin{aligned}
 (x+1)^2 + (y-3)^2 &= 9^2 \\
 (x+1)^2 + (y-3)^2 &= 81
 \end{aligned}$$



90. $x + 2y - 10 = 0$ $C(0, 0)$

$$2y = -x + 10$$

$$\textcircled{1} y = -\frac{1}{2}x + 10$$

$$\textcircled{4} x^2 + y^2 = r^2$$

$$4^2 + 8^2 = r^2$$

$$16 + 64 = r^2$$

$$r^2 = 80 \rightarrow 20$$

$$\textcircled{2} 2x = -\frac{1}{2}x + 10$$

$$\frac{5}{2}x = 10$$

$$5x = 20$$

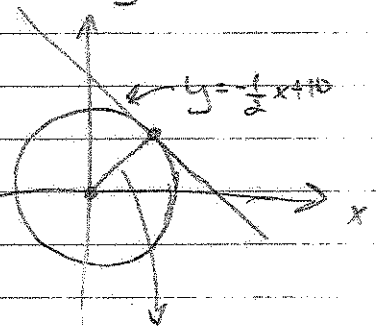
$$x = 4$$

$$y = 8$$

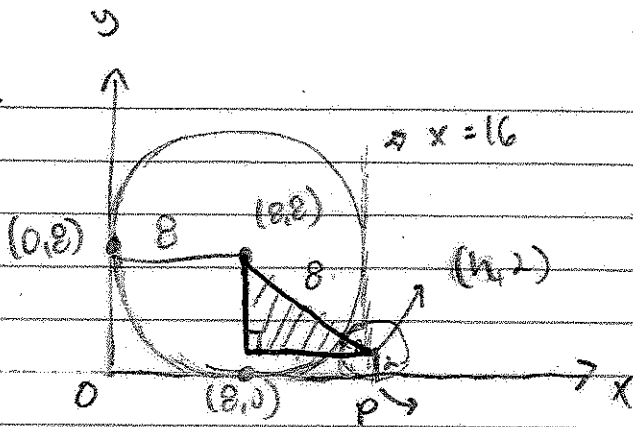
$$\textcircled{3} (4, 8)$$

$$\boxed{x^2 + y^2 = 80}$$

$$* \rightarrow x^2 + y^2 = 20$$



✓ 97.



$$\overline{OP} = 10$$

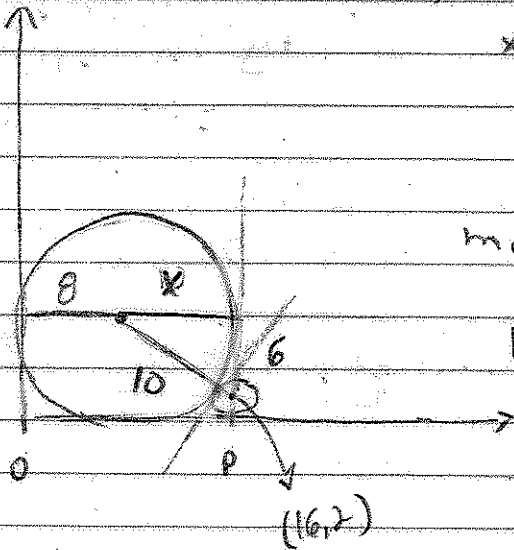
$$= \sqrt{8^2 + 8^2} = 10$$

Little circle: $(x-h)^2 + (y-k)^2 = r^2$

Grand circle: $(x-8)^2 + (y-8)^2 = 64$

a) $x^2 + 6^2 = 10^2$
 $x^2 = 100 - 36$
 $x^2 = 64$
 $x = 8$

$m \overline{OP} = 8 + 8 = 16$



b) $(x-16)^2 + (y-2)^2 = 4$