

Bloc 2 → Révision

3.4 Équation du cercle

Omnimath II p. 516-517 # 25 à 51

25.  $x^2 + y^2 = 9$     26.  $(x-3)^2 + (y-7)^2 = 49$

27.  $(x+7)^2 + (y+3)^2 = 36$     28.  $(x-6)^2 + (y+3)^2 = 144$

29.  $(x+4)^2 + (y-5)^2 = 5$     30.  $(x-11)^2 + (y+12)^2 = 27$

31.  $\sqrt{C(10,0)}$     32.  $\sqrt{C(1,0)}$     33.  $\sqrt{C(-3,4)}$     34.  $\sqrt{C(3,5; -6,5)}$   
 $r=11$      $r=0,5$      $r=9$      $r=8$

35.  $x^2 + y^2 = r^2$     36.  $x^2 + y^2 = r^2$     37.  $(x-2)^2 + (y-1)^2 = r^2$   
 $(-8)^2 + (6)^2 = r^2$      $0 + 9^2 = r^2$      $(5-2)^2 + (1-1)^2 = r^2$   
 $100 = r^2$      $81 = r^2$      $9 = r^2$   
 $r=10$      $x^2 + y^2 = 81$      $(x-2)^2 + (y-1)^2 = 9$   
 $x^2 + y^2 = 100$

38.  $(x+1)^2 + (y-3)^2 = r^2$     39.  $(x-4)^2 + (y+1)^2 = r^2$   
 $(5+1)^2 + (-5-3)^2 = r^2$      $(-4)^2 + (6+1)^2 = r^2$   
 $36 + 64 = r^2$      $16 + 49 = r^2$   
 $100 = r^2$      $65 = r^2$   
 $(x+1)^2 + (y-3)^2 = 100$      $(x-4)^2 + (y+1)^2 = 65$

40.  $(y+5)^2 + (x+5)^2 = r^2$      $(x+5)^2 + (y+5)^2 = 72$   
 $(1+5)^2 + (1+5)^2 = r^2$   
 $36 + 36 = r^2$   
 $r^2 = 72$

41. a)  $y = 3x + 10$       $x^2 + y^2 = 12$

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$$x^2 + (3x + 10)^2 = 12$$

$$x^2 + 9x^2 + 60x + 100 = 12$$

$$10x^2 + 60x + 88 = 0$$

$$(x + 3)(x + 8) = 0$$

$$x = -3 \quad (x = -8)$$

42. a)  $x - 3y = 10$       $x^2 + y^2 = 0$

$$x = 10 + 3y$$

$$(10 + 3y)^2 + y^2 = 0$$

$$100 + 60y + 9y^2 + y^2 = 0$$

$$10y^2 + 60y + 100 = 0$$

$$y^2 + 6y + 10 = 0$$

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

$$y = -3$$

$$x = 1$$

$$(1, -3)$$

43.  $y = -x + 1$       $(x - 1)^2 + (y + 4)^2 = 8$

$$(x - 1)^2 + (-x + 1 + 4)^2 = 8$$

$$x^2 - 2x + 1 + (-x + 5)^2 = 8$$

$$x^2 - 2x + 1 + x^2 - 10x + 25 = 8$$

$$2x^2 - 12x + 26 = 8$$

$$2x^2 - 12x + 18 = 0$$

$$x^2 - 6x + 9 = 0$$

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

$$x = 3$$

$$y = -2$$

$$(3, -2)$$

## Révision Bloc 2 3,4 équation du Cercle #25 à 51

$$44. a) y = -x - 4 \quad (x+3)^2 + (y+2)^2 = 13$$

$$(x+3)^2 + (-x-4+2)^2 = 13$$

$$(x+3)^2 + (-x-2)^2 = 13$$

$$x^2 + 6x + 9 + x^2 + 2x + 2x + 4 = 13$$

$$2x^2 + 10x + 13 = 13$$

$$2x^2 + 10x = 0$$

$$2x(x+5) = 0$$

$$x = 0 \rightarrow y = -4$$

$$x = -5 \rightarrow y = 1 \quad (0, -4) \quad (-5, 1)$$

$$b) \quad d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$d = \sqrt{(-5 - 0)^2 + (1 - (-4))^2}$$

$$d = \sqrt{(25) + (25)}$$

$$d = \sqrt{50} = 5\sqrt{2}$$

$$45 \quad x + 2y + 1 = 0 \quad (x+2)^2 + (y-3)^2 = 5$$

$$x = -2y - 1 \quad (-2y - 1 + 2)^2 + (y - 3)^2 = 5$$

$$(-2y + 1)^2 + (y - 3)^2 = 5$$

$$(4y^2 - 4y + 1) + (y^2 - 6y + 9) = 5$$

$$5y^2 - 10y + 10 = 5$$

$$5y^2 - 10y + 5 = 0$$

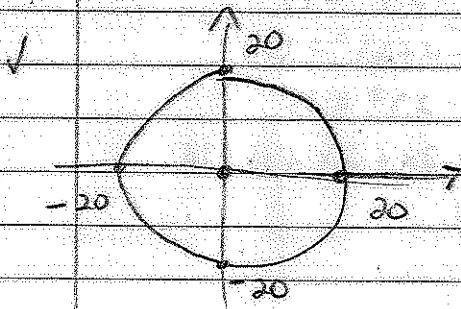
$$y^2 - 2y + 1 = 0$$

$$\checkmark \quad (y-1)(y-1)$$

$$y = 1 \quad x = -3$$

$$(-3, 1)$$

46.  $x^2 + y^2 = 400$   $\sqrt{400} = 20$

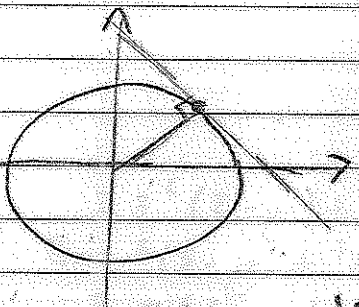


$$\begin{array}{l} x = 20 \quad y = 20 \\ x = -20 \quad y = -20 \end{array}$$

47.  $x = 15$   $x = -15$

✓  $y = 15$   $y = -15$

48.  $x^2 + y^2 = 17$   $(1, 4)$  Équation de la tangente



$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{4 - 0}{1 - 0} = 4$$

$$m_{\perp} = -\frac{1}{4}$$

$$y = mx + b$$

$$y = -\frac{1}{4}x + b$$

$$4 = -\frac{1}{4}(1) + b$$

$$4 = -\frac{1}{4} + b$$

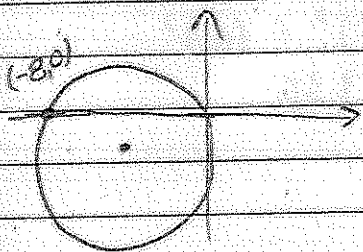
$$\frac{17}{4} = b$$

✓  $y = -\frac{1}{4}x + \frac{17}{4}$

Révision Bloc 2 3, 4 équations du cercle  
 49. Ommimath p. 516-517 #25251

$$(x+5)^2 + (y+2)^2 = 13 \quad \text{point } (-8, 0)$$

$$C(-5, -2)$$



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

$$= \frac{0 - (-2)}{-8 - (-5)} = \frac{2}{-3} = -\frac{2}{3}$$

$$m = \frac{3}{2}$$

$$y = \frac{3}{2}x + b$$

$$0 = \frac{3}{2}(-8) + b$$

$$0 = -12 + b$$

$$b = 12$$

$$y = \frac{3}{2}x + 12$$

50. Longueur de la tangente

$$x^2 + y^2 = 34 \quad P(-7, -11) \quad (10, 0)$$

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

$$c^2 = (0 - (-7))^2 + (0 - (-11))^2$$

$$c^2 = 49 + 121$$

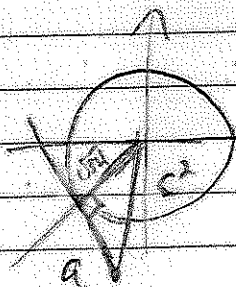
$$c^2 = 170$$

$$a^2 = 136$$

$$a = 11,66 \text{ unités}$$

$$a^2 + b^2 = c^2$$

$$a^2 + 34 = 170$$



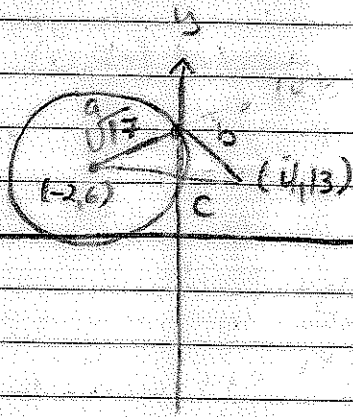
51.

$$(x+2)^2 + (y-6)^2 = 17$$

 $x_1, y_1$ 

$$P(4, 13)$$

$$C(-2, 6)$$

 $x_2, y_2$ 

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

$$c^2 = (13 - 6)^2 + (-2 - 4)^2$$

$$c^2 = (7)^2 + (6)^2$$

$$c^2 = 49 + 36$$

$$c^2 = 85$$

$$a^2 + b^2 = c^2$$

$$c^2 - a^2 = b^2$$

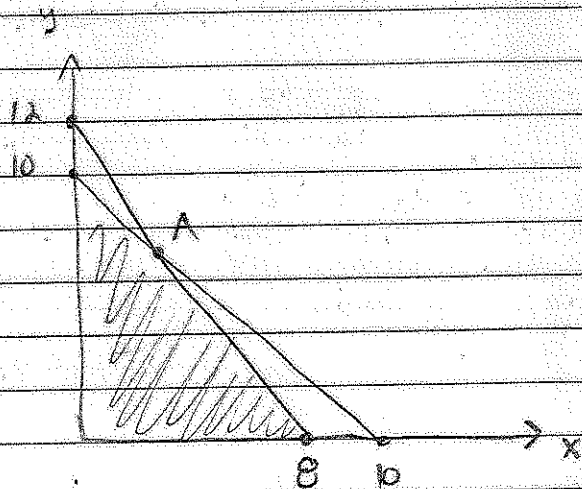
$$85 - 17 = b^2$$

$$68 = b^2$$

$$b = 8,25$$

révision Bloc 2 p. 92-93 #2-5 Omnimath II

12.  $x \geq 0$   $x+y \leq 10$   $x$ : messages à 200\$  
 $y \geq 0$   $300x + 200y \leq 2400$   $y$ : messages à 300\$



$$y \leq -x + 10$$

$$0 = -x + 10$$

$$x = 10$$

$$200y \leq -300x + 2400$$

$$y \leq \frac{-3x + 12}{2}$$

$$0 = \frac{-3x + 12}{2}$$

$(0,0)$   $(8,0)$   $(0,10)$  et  $(4,6)$

$$\frac{3}{2}x = 12$$

A  $y = -x + 10$   
 $y = \frac{-3x + 12}{2}$

$$x = \frac{24}{3} = 8$$

$$-x + 10 = \frac{-3x + 12}{2}$$

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

$$\frac{1}{2}x = 2$$

$$x = 4$$

$$y = 6$$

$(4,6)$

3.  $8000x + 6000y$

$(0,0) \rightarrow 0$

$(8,0) \rightarrow 16000$

$(0,10) \rightarrow 60000$

$(4,6) \rightarrow 32000 + 36000 = 68000$

4. 68000 personnes = max

5. 4 fois de 6 à 9h et 6 fois de 16 à 18h

12.  $x^2 + 3x - 28 = 0$   
 $(x+7)(x-4)$   
 $\checkmark x = -7 \quad x = 4$

13.  $y^2 - 5y + 6 = 0$   
 $(y-2)(y-3) = 0$   
 $\checkmark y = 2 \quad y = 3$

14.  $g^2 + 7g + 10 = 0$   
 $(g+2)(g+5) = 0$   
 $\checkmark g = -2 \quad g = -5$

15.  $2x^2 + 5x - 3 = 0$   
 $-1 + 6 = 5$   
 $-1 \times 6 = -6$

16.  $2n^2 + 15n - 27 = 0$   
 $-3 + 9 = 15$   
 $-3 \times 9 = -27$   
 $2n^2 + 18n - 3n - 27$   
 $2n(n+9) - 3(n+9)$

17.  $8k^2 - 3k = 0$   
 $k(8k-3) = 0$   
 $k = 0 \quad 8k - 3 = 0$   
 $8k = 3$   
 $\checkmark k = \frac{3}{8}$

$2x^2 - x + 6x - 3 = 0$   
 $x(2x-1) + 3(2x-1) = 0$   
 $(x+3)(2x-1) = 0$   
 $x = -3 \quad 2x-1 = 0$

$(2n-3)(n+9)$   
 $2n = 3 \quad n = -9$   
 $\checkmark n = \frac{3}{2}$

19.  $x+3 = \frac{4}{x} \quad x \neq 0$

$\checkmark 2x = 1$   
 $x = \frac{1}{2}$

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

$\checkmark (x+4)(x-1) = 0$   
 $x = -4 \quad x = 1$

18.  $3w(w-4) + w + 4(w+1) = 0$   
 $3w^2 - 12w + w + 4w + 4 = 0$   
 $3w^2 - 7w + 4 = 0$   
 $-\frac{3}{2} \times -4 = 12$   
 $-\frac{3}{2} + -4 = -7$

20.  $x+2 = \frac{x+2}{x-2} \quad x \neq 2$

$(x+2)(x-2) = (x+2)$   
 $x^2 - 4 - x - 2 = 0$   
 $x^2 - x - 6 = 0$   
 $(x-3)(x+2) = 0$   
 $\checkmark x = +3 \quad x = -2$

$3w^2 - 3w - 4w + 4 = 0$   
 $3w(w-1) - 4(w-1)$   
 $(3w-4)(w-1)$   
 $3w = 4 \quad w = 1$

$\checkmark w = \frac{4}{3}$

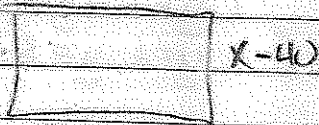
21.  $5, -1$

$\checkmark (x-5)(x+1) = x^2 - 4x - 5$



$$22. \left(\frac{1}{2}, 4\right) \rightarrow \frac{(x-\frac{1}{2})(x-4)}{2} = \frac{x^2 - 9x + 2}{2}$$

$$23. A = 225 \text{ m}^2$$



$$x(x-40) = 225$$

$$x^2 - 40x - 225 = 0$$

$$(x-45)(x+5) = 0$$

$$x = 45 \quad x \neq -5$$

$$45 \times 5 \text{ m}$$

$$24. q^2 - 11 = 14$$

$$q^2 = 25$$

$$q = \pm 5$$

$$25. 18 + b^2 = 82$$

$$b^2 = 64$$

$$b = \pm 8$$

$$\checkmark 26. (x-2)^2 = 81$$

$$x-2 = \pm 9$$

$$x = 2 \pm 9$$

$$x_1 = 11 \quad x_2 = -7$$

$$27. 2(h+3)^2 = 98$$

$$(h+3)^2 = 49$$

$$(h+3) = \pm 7$$

$$h = -3 \pm 7$$

$$h_1 = -10 \quad h_2 = 4$$

$$28. p^2 - 1 = 49$$

$$p^2 = 50$$

$$p = \pm \sqrt{50}$$

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

$$29. 3r^2 = 36$$

$$r^2 = 12$$

$$r = \pm \sqrt{12}$$

$$r = \pm 2\sqrt{3}$$

$$30. -2 = 38 - 5v^2$$

$$-40 = -5v^2$$

$$8 = v^2$$

$$v = \pm \sqrt{8} = \pm 2\sqrt{2}$$

$$31. \frac{x^2}{9} = \frac{1}{2}$$

$$x^2 = \frac{9}{2}$$

$$x = \pm \frac{3}{\sqrt{2}} = \pm \frac{3\sqrt{2}}{2}$$

32.  $3 = q^2 - 1$  ✓ 33.  $x^2 - 2x + 8 = 0$

$4 = q^2$

$q = \pm 2$

✓  $q = 2$

$x^2 - 2x + 1 - 1 + 8 = 0$

$(x-1)^2 - 9 = 0$

$(x-1)^2 = 9$

$x-1 = \pm 3$

$x = 1 \pm 3$

$x = 4$  ou  $x = -2$

34.  $n^2 + 8n + 5 = 0$

$n^2 + 8n + 16 - 16 + 5 = 0$

$(n+4)^2 - 11 = 0$

$(n+4)^2 = 11$

✓  $(n+4) = \pm \sqrt{11}$

$n = -4 \pm \sqrt{11}$

35.  $t^2 + 5t + 1 = 0$

$t^2 + 5t + \frac{25}{4} - \frac{25}{4} + 1 = 0$

$(t + \frac{5}{2})^2 - \frac{21}{4} = 0$

$(t + \frac{5}{2})^2 = \frac{21}{4}$

$t + \frac{5}{2} = \pm \frac{\sqrt{21}}{2}$

$t = -\frac{5}{2} \pm \frac{\sqrt{21}}{2}$

36.  $x^2 - 3x - 2 = 0$

$x^2 - 3x + \frac{9}{4} - \frac{9}{4} - 2 = 0$  ✓

$(x - \frac{3}{2})^2 - \frac{17}{4} = 0$

$(x - \frac{3}{2})^2 = \frac{17}{4}$

$x - \frac{3}{2} = \pm \frac{\sqrt{17}}{2}$

✓  $x = \frac{3 \pm \sqrt{17}}{2}$

37.  $x^2 - 5x - 9 = 0$

$x^2 - 5x + \frac{25}{4} - \frac{25}{4} - 9 = 0$

$(x - \frac{5}{2})^2 - \frac{61}{4} = 0$

$(x - \frac{5}{2})^2 = \frac{61}{4}$

$(x - \frac{5}{2}) = \pm \frac{\sqrt{61}}{2}$

✓  $x = \frac{5 \pm \sqrt{61}}{2}$

$$38. a^2 + 3a - 3 = 0$$

$$a^2 + 3a + \frac{9}{4} - \frac{9}{4} - 3 = 0$$

$$\left(\frac{a+3}{2}\right)^2 - \frac{21}{4} = 0$$

$$\left(\frac{a+3}{2}\right)^2 = \frac{21}{4}$$

$$\frac{a+3}{2} = \pm \frac{\sqrt{21}}{2}$$

$$\checkmark a = \frac{-3 \pm \sqrt{21}}{2}$$

$$39. 0 = 3z^2 + 5z + 1$$

$$0 = 3\left(z^2 + \frac{5z}{3} + 1\right)$$

$$0 = 3\left(z^2 + \frac{5z}{3} + \frac{25}{36} - \frac{25}{36} + 1\right)$$

$$0 = 3\left(\frac{z+\frac{5}{6}}{6}\right)^2 - \frac{25}{12} + 1$$

$$0 = 3\left(\frac{z+\frac{5}{6}}{6}\right)^2 - \frac{13}{12}$$

$$\frac{13}{12} = 3\left(\frac{z+\frac{5}{6}}{6}\right)^2$$

$$\frac{13}{36} = \left(\frac{z+\frac{5}{6}}{6}\right)^2$$

$$\pm \frac{\sqrt{13}}{6} = \frac{z+\frac{5}{6}}{6}$$

$$\checkmark \frac{-5 \pm \sqrt{13}}{6} = z$$

$$40. 6x^2 + 2x - 5 = 0$$

$$6\left(x^2 + \frac{1}{3}x\right) - 5 = 0$$

$$6\left(x^2 + \frac{1}{3}x + \frac{1}{36} - \frac{1}{36}\right) - 5 = 0$$

$$6\left(x + \frac{1}{6}\right)^2 - \frac{1}{6} - 5 = 0$$

$$6\left(x + \frac{1}{6}\right)^2 - \frac{31}{6} = 0$$

$$6\left(x + \frac{1}{6}\right)^2 = \frac{31}{6}$$

$$\left(x + \frac{1}{6}\right) = \pm \sqrt{\frac{31}{36}}$$

$$x = \frac{-1 \pm \sqrt{31}}{6}$$

#12 à 53

46.  $-1 = \frac{1}{2}y^2 - 2y$

$0 = \frac{1}{2}y^2 - 2y + 1$

$0 = y^2 - 4y + 2$

$0 = y^2 - 4y + 4 - 4 + 2$

$0 = (y-2)^2 - 2$

$2 = (y-2)^2$

$\pm\sqrt{2} = y-2$

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

42.  $0,6x^2 - 0,5x - 0,1 = 0$

$6x^2 - 5x - 1 = 0$

$6(x^2 - \frac{5}{6}x) - 1 = 0$

$6(x^2 - \frac{5}{6}x + \frac{25}{144} - \frac{25}{144}) - 1 = 0$

$6(x^2 - \frac{5}{6}x + \frac{25}{144}) - \frac{25}{24} - 1 = 0$

$6(\frac{x-5}{12})^2 - \frac{49}{24} = 0$

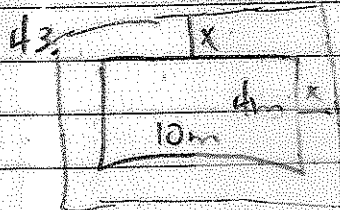
$6(\frac{x-5}{12})^2 = \frac{49}{24}$

$(\frac{x-5}{12})^2 = \frac{49}{144}$

$\frac{x-5}{12} = \pm \sqrt{\frac{49}{144}}$   $x_1 = 1$

$\frac{x-5}{12} = \pm \frac{7}{12}$   $x_2 = -\frac{1}{6}$

$x = \frac{5}{12} \pm \frac{7}{12} =$



$(2x+4)(2x+10) = 135$

$4x^2 + 8x + 20x + 40 = 135$

$4x^2 + 28x - 95 = 0$

$4(x^2 + 7x) - 95 = 0$

$4(x^2 + 7x + \frac{49}{4} - \frac{49}{4}) - 95 = 0$

$4(\frac{x+7}{2})^2 - 49 - 95 = 0$

$4(\frac{x+7}{2})^2 = 144$

$(x + \frac{7}{2})^2 = 36$

$x + \frac{7}{2} = \pm 6$

$x = -\frac{7}{2} \pm 6$

$x = \frac{5}{2} = 2,5m$

$$44. \quad n^2 + n - 42 = 0$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-1 \pm \sqrt{1^2 - 4(1)(-42)}}{2(1)}$$

$$x = \frac{-1 \pm 13}{2}$$

$$\checkmark \quad x_1 = \frac{12}{2} = 6 \quad x_2 = \frac{-14}{2} = -7$$

$$45. \quad 2x^2 - 7x + 3 = 0$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-(-7) \pm \sqrt{(-7)^2 - 4(2)(3)}}{2(2)}$$

$$\frac{7 \pm \sqrt{25}}{4}$$

$$x = \frac{7 \pm 5}{4} \quad x_1 = \frac{-2}{4} = -\frac{1}{2} \quad x_2 = \frac{12}{4} = 3$$

$$46. \quad 7g^2 - 9g + 2 = 0$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{9 \pm \sqrt{9^2 - 4(7)(2)}}{2(7)}$$

$$x = \frac{9 \pm \sqrt{25}}{14}$$

$$x = \frac{9 \pm 5}{14} \quad x_1 = \frac{2}{7} \quad x_2 = 1$$

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#12 à 53

$$47. \quad 4m^2 = 3 + 4m \\ 4m^2 - 4m - 3 = 0$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{4 \pm \sqrt{6 - 4(4)(-3)}}{2(4)}$$

$$x = \frac{4 \pm \sqrt{54}}{8}$$

$$x = \frac{4 \pm 8}{8}$$

$$x = \frac{12}{8} \quad \text{ou} \quad x = \frac{-4}{8} = -\frac{1}{2} \quad \checkmark \\ = \frac{3}{2}$$

$$49. \quad 0 = 9^2 + 6q + 6$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-6 \pm \sqrt{6^2 - 4(4)(6)}}{2}$$

$$x = \frac{-6 \pm \sqrt{12}}{2}$$

$$x = \frac{-6 \pm 2\sqrt{3}}{2}$$

$$x = -3 \pm \sqrt{3} \quad \checkmark$$

$$48. \quad k^2 - 10k = 9$$

$$k^2 - 10k - 9 = 0$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{10 \pm \sqrt{(-10)^2 - 4(1)(-9)}}{2(1)}$$

$$x = \frac{10 \pm \sqrt{136}}{2}$$

$$x = \frac{10 \pm 2\sqrt{34}}{2}$$

$$x = 5 \pm \sqrt{34} \quad \checkmark$$

$$50. \quad 2w^2 = 9 + 3w$$

$$2w^2 - 3w - 9 = 0$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{3 \pm \sqrt{9 - 4(2)(-9)}}{2(2)}$$

$$x = \frac{3 \pm \sqrt{297}}{4}$$

$$x = \frac{3 \pm 3\sqrt{33}}{4} \quad \checkmark$$

$$51. \quad 4 = 5x + 3x^2$$

$$0 = 3x^2 + 5x - 4$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-5 \pm \sqrt{25 - 4(3)(-4)}}{2(3)}$$

$$x = \frac{-5 \pm \sqrt{25 + 48}}{6}$$

$$\checkmark x = \frac{-5 \pm \sqrt{73}}{6}$$

$$52. \quad 6x^2 + x - 4 = 0$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-1 \pm \sqrt{1 - 4(6)(-4)}}{2(6)}$$

$$x = \frac{-1 \pm \sqrt{97}}{12}$$

$$x_1 = 0,74$$

$$\checkmark x_2 = -0,90$$

$$53. \quad 1,2x^2 + 0,5x - 0,3 = 0$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-0,5 \pm \sqrt{(0,5)^2 - 4(1,2)(-0,3)}}{2(1,2)}$$

$$x = \frac{-0,5 \pm \sqrt{1,69}}{2,4}$$

$$\checkmark x_1 = 0,3$$

$$x_2 = -0,75$$