

Ma 30321

Résolution d'équations quadratiques

$$a) a^2 - 8a + 16 = 0$$

$$(a-4)(a-4) = 0$$

$$\boxed{a=4}$$

$$b) w^2 + 30 = 9 + 10w$$

$$w^2 - 10w + 21 = 0$$

$$w = \frac{10 \pm \sqrt{100 - 4(21)}}{2}$$

100-84

$$w = \frac{10 \pm \sqrt{16}}{2}$$

$$w = \frac{10 \pm 4}{2}$$

~~aucune solution~~

$$w = 7 \text{ ou } w = 3$$

$$c) -3x^2 + 4x + 1 = 0$$

$$3x^2 - 4x - 1 = 0$$

$$x = \frac{4 \pm \sqrt{16 - 4(3)(-1)}}{2(3)}$$

$$x = \frac{4 \pm \sqrt{16+12}}{6}$$

$$x = \frac{4 \pm \sqrt{28}}{6} = \frac{4 \pm 2\sqrt{7}}{6}$$

$$x = \frac{2 \pm \sqrt{7}}{3}$$

$$\boxed{x = \frac{2 \pm \sqrt{7}}{3}}$$

$$d) x(4-x) = 0$$

$$\boxed{x=0} \quad \boxed{x=4}$$

$$e) 2t^2 + 11t + 5 = 0$$

$$2t^2 + 10t + 1t + 5 = 0$$

$$2t(t+5) + 1(t+5) = 0$$

$$(t+5)(2t+1) = 0$$

$$\boxed{t=-5} \quad \boxed{t=-\frac{1}{2}}$$

$$f) 4 = m^2 - 2m$$

$$0 = m^2 - 2m - 4$$

$$m = \frac{2 \pm \sqrt{4 - 4(-4)}}{2}$$

$$m = \frac{2 \pm \sqrt{4+16}}{2}$$

$$m = \frac{2 \pm \sqrt{20}}{2}$$

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

$$\boxed{m = 1 \pm \sqrt{5}}$$

$$g) 10y^2 - 16y = -6$$

$$10y^2 - 16y + 6 = 0$$

$$5y^2 - 8y + 3 = 0$$

$$5y^2 - 5y - 3y + 3 = 0$$

$$5y(y-1) - 3(y-1) = 0$$

$$(y-1)(5y-3) = 0$$

$$\boxed{y=1}$$

$$\boxed{y=\frac{3}{5}}$$

$$h) 3(z^2+1) = -4z$$

$$3z^2 + 3 + 4z = 0$$

$$3z^2 + 4z + 3 = 0$$

$$z = \frac{-4 \pm \sqrt{16 - 4(3)(3)}}{2(3)}$$

$$z = \frac{-4 \pm \sqrt{16 - 36}}{6}$$

$$z = \frac{-4 \pm \sqrt{-20}}{6}$$

aucune solution

$$i) 9x^2 - 6x + 1 = 0$$

$$9x^2 - 3x - 3x + 1 = 0$$

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

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

$$\boxed{x=\frac{1}{3}}$$

$$j) 4t^2 = 12t - 9$$

$$4t^2 - 12t + 9 = 0$$

$$4t^2 - 6t - 6t + 9 = 0$$

$$2t(2t-3) - 3(2t-3) = 0$$

$$(2t-3)(2t-3) = 0$$

$$\boxed{t=\frac{3}{2}}$$

$$l) x^2 + x - 1 = 0$$

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

$$x = \frac{-1 \pm \sqrt{1+4}}{2}$$

$$\boxed{x = \frac{-1 \pm \sqrt{5}}{2}}$$

$$x = 0,618 \quad x = -1,618$$

$$m) 7x^2 - 2x - 2 = 0$$

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

$$x = \frac{2 \pm \sqrt{60}}{14}$$

$$x = \frac{2 \pm 2\sqrt{15}}{14}$$

$$\boxed{x = \frac{1 \pm \sqrt{15}}{7}}$$

$$k) x^2 - 2x - 11 = 4$$

$$x^2 - 2x - 15 = 0$$

$$(x-5)(x+3) = 0$$

$$\boxed{x=5}$$

$$\boxed{x=-3}$$

$$n) (x+1)^2 = 4$$

$$x+1 = \pm 2$$

$$x = -1 \pm 2$$

$$x = 1$$

$$x = -3$$

$$o) 5t^2 - 20t = 0$$

$$5t(t-4) = 0$$

$$t = 0$$

$$t = 4$$

$$p) 4x^2 + 16x + 15 = 0$$

$$4x^2 + 6x + 10x + 15 = 0$$

$$2x(2x+3) + 5(2x+3) = 0$$

$$(2x+3)(2x+5) = 0$$

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

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

$$q) 2x^2 = 3 - 8x$$

$$2x^2 + 8x - 3 = 0$$

$$x = \frac{-8 \pm \sqrt{64 - 4(2)(-3)}}{2(2)}$$

$$x = \frac{-8 \pm \sqrt{88}}{4}$$

$$x = \frac{-8 \pm 2\sqrt{22}}{4}$$

$$x = \frac{-4 \pm \sqrt{22}}{2}$$

$$r) 4x = 5 - 4x^2$$

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

$$x = \frac{-4 \pm \sqrt{16 - 4(4)(-5)}}{2(4)}$$

$$x = \frac{-4 \pm \sqrt{96}}{8}$$

$$x = \frac{-4 \pm 4\sqrt{6}}{8}$$

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