MATEMATICAULA

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PUZZLES

QUADRATIC EQUATIONS

ECUACIONES DE 2º GRADO

MATEMATICAULA

$x^2 - 16x + 64 = 0$	$x = \frac{-(-12) \pm \sqrt{(-12)^2 - 4(1)(36)}}{2(1)} = \frac{12 \pm \sqrt{0}}{2}$	$x_1 = \frac{-1+9}{2} = 4$ $x_2 = \frac{-1-9}{2} = -5$
$x^2 - 11x + 28 = 0$	$x = \frac{-(1) \pm \sqrt{(1)^2 - 4(1)(-2)}}{2(1)} = \frac{-1 \pm \sqrt{9}}{2}$	$x_1 = \frac{16+0}{2} = 8$ $x_2 = \frac{16-0}{2} = 8$
$x^2 - 6x - 27 = 0$	$x = \frac{-(-16) \pm \sqrt{(-16)^2 - 4(1)(64)}}{2(1)} = \frac{16 \pm \sqrt{0}}{2}$	$x_1 = \frac{6+12}{2} = 9$ $x_2 = \frac{6-12}{2} = -3$
$x^2 + x - 2 = 0$	$x = \frac{-(-11) \pm \sqrt{(-11)^2 - 4(1)(28)}}{2(1)} = \frac{11 \pm \sqrt{9}}{2}$	$x_1 = \frac{-1+13}{2} = 6$ $x_2 = \frac{-1-13}{2} = -7$
$x^2 + x - 20 = 0$	$x = \frac{-(1) \pm \sqrt{(1)^2 - 4(1)(-42)}}{2(1)} = \frac{-1 \pm \sqrt{169}}{2}$	$x_1 = \frac{-1+3}{2} = 1$ $x_2 = \frac{-1-3}{2} = -2$
$x^2 - 12x + 36 = 0$	$x = \frac{-(1) \pm \sqrt{(1)^2 - 4(1)(-20)}}{2(1)} = \frac{-1 \pm \sqrt{81}}{2}$	$x_1 = \frac{11+3}{2} = 7$ $x_2 = \frac{11-3}{2} = 4$
$x^2 + x - 42 = 0$	$x = \frac{-(-6) \pm \sqrt{(-6)^2 - 4(1)(-27)}}{2(1)} = \frac{6 \pm \sqrt{144}}{2}$	$x_1 = \frac{14+4}{2} = 9$ $x_2 = \frac{14-4}{2} = 5$
$x^2 - 14x + 45 = 0$	$x = \frac{-(-14) \pm \sqrt{(-14)^2 - 4(1)(45)}}{2(1)} = \frac{14 \pm \sqrt{16}}{2}$	$x_1 = \frac{12+0}{2} = 6$ $x_2 = \frac{12-0}{2} = 6$

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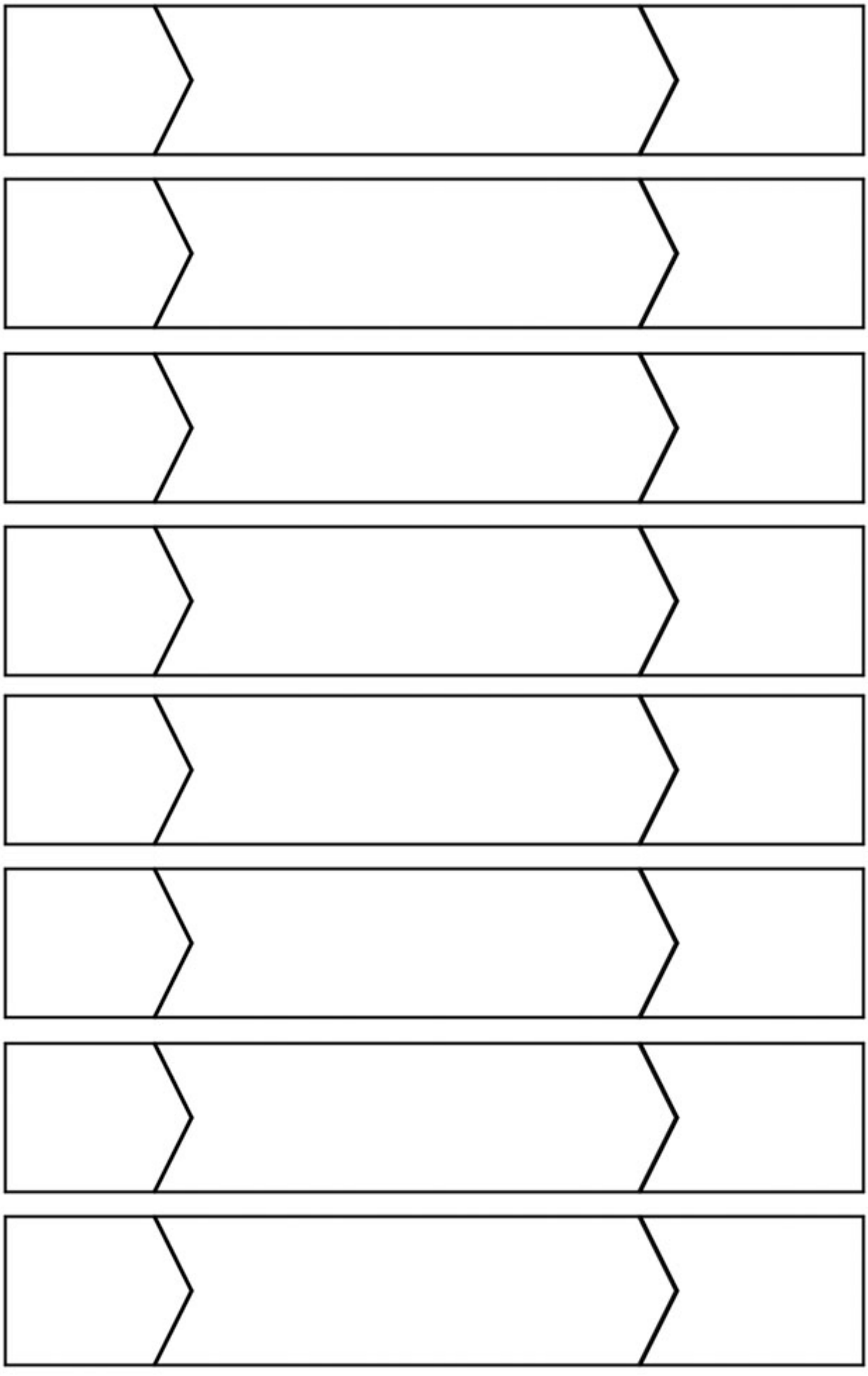

MATEMATICAULA

$-3x^2 + 27x - 54 = 0$	$x = \frac{-(-6) \pm \sqrt{(-6)^2 - 4(-2)(20)}}{2(-2)} = \frac{6 \pm \sqrt{196}}{-4} = \frac{6 \pm 14}{-4}$	$x_1 = \frac{-9 + 21}{6} = 2$ $x_2 = \frac{-9 - 21}{6} = -5$
$2x^2 + 10x - 12 = 0$	$x = \frac{-(42) \pm \sqrt{(42)^2 - 4(3)(147)}}{2(3)} = \frac{-42 \pm \sqrt{0}}{6} = \frac{-42 \pm 0}{6}$	$x_1 = \frac{-18 + 14}{-4} = 1$ $x_2 = \frac{-18 - 14}{-4} = 8$
$-2x^2 - 6x + 20 = 0$	$x = \frac{-(27) \pm \sqrt{(27)^2 - 4(-3)(-54)}}{2(-3)} = \frac{-27 \pm \sqrt{81}}{-6} = \frac{-27 \pm 9}{-6}$	$x_1 = \frac{15 + 1}{-2} = -8$ $x_2 = \frac{15 - 1}{-2} = -7$
$-3x^2 - 3x + 18 = 0$	$x = \frac{-(9) \pm \sqrt{(9)^2 - 4(3)(-30)}}{2(3)} = \frac{-9 \pm \sqrt{441}}{6} = \frac{-9 \pm 21}{6}$	$x_1 = \frac{-10 + 14}{4} = 1$ $x_2 = \frac{-10 - 14}{4} = -6$
$3x^2 + 9x - 30 = 0$	$x = \frac{-(-15) \pm \sqrt{(-15)^2 - 4(-1)(-56)}}{2(-1)} = \frac{15 \pm \sqrt{1}}{-2} = \frac{15 \pm 1}{-2}$	$x_1 = \frac{3 + 15}{-6} = -3$ $x_2 = \frac{3 - 15}{-6} = 2$
$-2x^2 + 18x - 16 = 0$	$x = \frac{-(10) \pm \sqrt{(10)^2 - 4(2)(-12)}}{2(2)} = \frac{-10 \pm \sqrt{196}}{4} = \frac{-10 \pm 14}{4}$	$x_1 = \frac{-27 + 9}{-6} = 3$ $x_2 = \frac{-27 - 9}{-6} = 6$
$-x^2 - 15x - 56 = 0$	$x = \frac{-(18) \pm \sqrt{(18)^2 - 4(-2)(-16)}}{2(-2)} = \frac{-18 \pm \sqrt{196}}{-4} = \frac{-18 \pm 14}{-4}$	$x_1 = \frac{6 + 14}{-4} = -5$ $x_2 = \frac{6 - 14}{-4} = 2$
$3x^2 + 42x + 147 = 0$	$x = \frac{-(-3) \pm \sqrt{(-3)^2 - 4(-3)(18)}}{2(-3)} = \frac{3 \pm \sqrt{225}}{-6} = \frac{3 \pm 15}{-6}$	$x_1 = \frac{-42 + 0}{6} = -7$ $x_2 = \frac{-42 - 0}{6} = -7$

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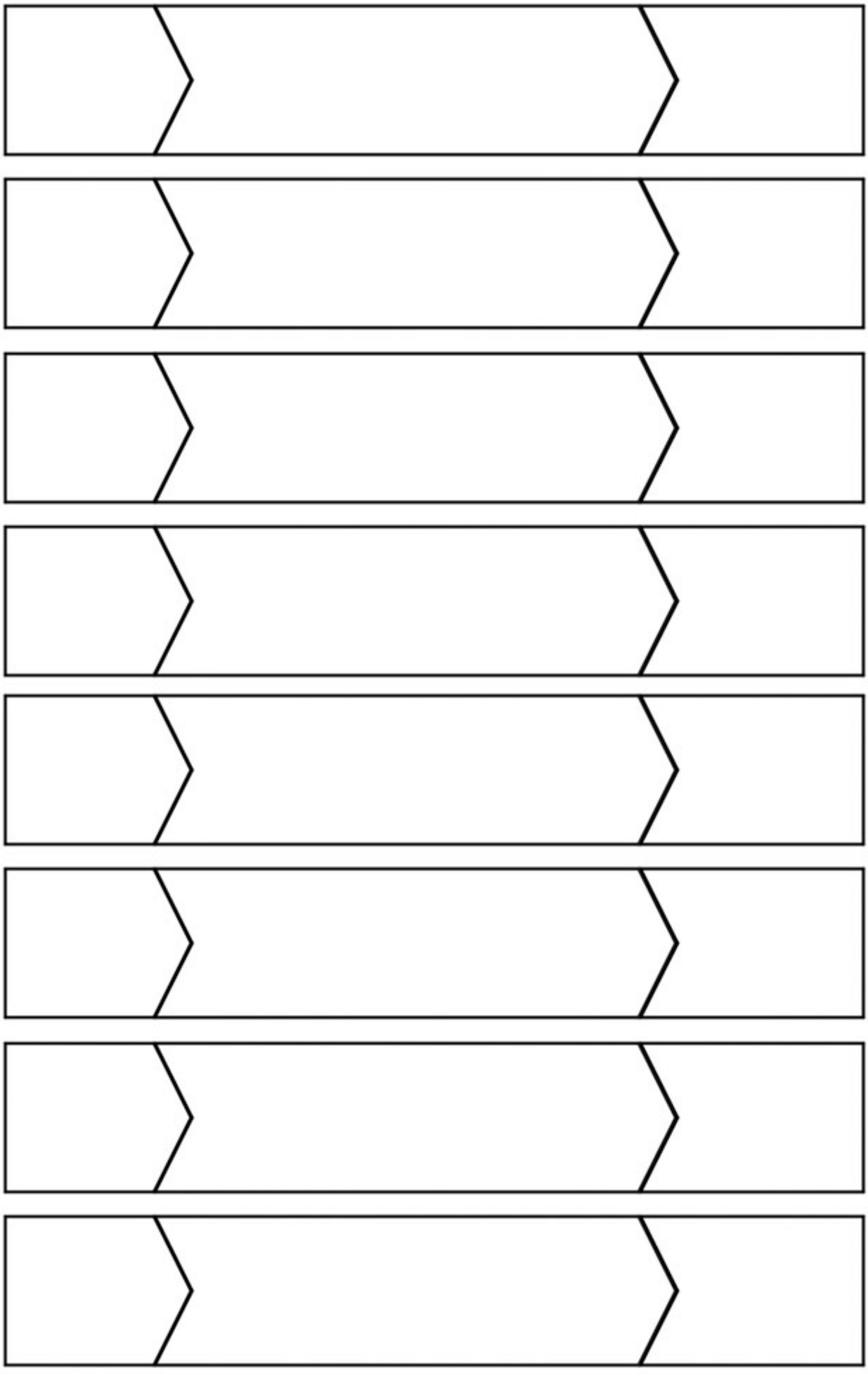

MATEMATICAULA

SOLUTIONS
SOLUCIONES

MATEMATICAULA

$x^2 - 16x + 64 = 0$	$x = \frac{-(-16) \pm \sqrt{(-16)^2 - 4(1)(64)}}{2(1)} = \frac{16 \pm \sqrt{0}}{2}$	$x_1 = \frac{16+0}{2} = 8$ $x_2 = \frac{16-0}{2} = 8$
$x^2 - 11x + 28 = 0$	$x = \frac{-(-11) \pm \sqrt{(-11)^2 - 4(1)(28)}}{2(1)} = \frac{11 \pm \sqrt{9}}{2}$	$x_1 = \frac{11+3}{2} = 7$ $x_2 = \frac{11-3}{2} = 4$
$x^2 - 6x - 27 = 0$	$x = \frac{-(-6) \pm \sqrt{(-6)^2 - 4(1)(-27)}}{2(1)} = \frac{6 \pm \sqrt{144}}{2}$	$x_1 = \frac{6+12}{2} = 9$ $x_2 = \frac{6-12}{2} = -3$
$x^2 + x - 2 = 0$	$x = \frac{-(1) \pm \sqrt{(1)^2 - 4(1)(-2)}}{2(1)} = \frac{-1 \pm \sqrt{9}}{2}$	$x_1 = \frac{-1+3}{2} = 1$ $x_2 = \frac{-1-3}{2} = -2$
$x^2 + x - 20 = 0$	$x = \frac{-(1) \pm \sqrt{(1)^2 - 4(1)(-20)}}{2(1)} = \frac{-1 \pm \sqrt{81}}{2}$	$x_1 = \frac{-1+9}{2} = 4$ $x_2 = \frac{-1-9}{2} = -5$
$x^2 - 12x + 36 = 0$	$x = \frac{-(-12) \pm \sqrt{(-12)^2 - 4(1)(36)}}{2(1)} = \frac{12 \pm \sqrt{0}}{2}$	$x_1 = \frac{12+0}{2} = 6$ $x_2 = \frac{12-0}{2} = 6$
$x^2 + x - 42 = 0$	$x = \frac{-(1) \pm \sqrt{(1)^2 - 4(1)(-42)}}{2(1)} = \frac{-1 \pm \sqrt{169}}{2}$	$x_1 = \frac{-1+13}{2} = 6$ $x_2 = \frac{-1-13}{2} = -7$
$x^2 - 14x + 45 = 0$	$x = \frac{-(-14) \pm \sqrt{(-14)^2 - 4(1)(45)}}{2(1)} = \frac{14 \pm \sqrt{16}}{2}$	$x_1 = \frac{14+4}{2} = 9$ $x_2 = \frac{14-4}{2} = 5$

MATEMATICAULA

$-3x^2 + 27x - 54 = 0$

$$x = \frac{-(27) \pm \sqrt{(27)^2 - 4(-3)(-54)}}{2(-3)} = \frac{-27 \pm \sqrt{81}}{-6} = \frac{-27 \pm 9}{-6}$$

$$x_1 = \frac{-27 + 9}{-6} = 3$$
$$x_2 = \frac{-27 - 9}{-6} = 6$$

$2x^2 + 10x - 12 = 0$

$$x = \frac{-(10) \pm \sqrt{(10)^2 - 4(2)(-12)}}{2(2)} = \frac{-10 \pm \sqrt{196}}{4} = \frac{-10 \pm 14}{4}$$

$$x_1 = \frac{-10 + 14}{4} = 1$$
$$x_2 = \frac{-10 - 14}{4} = -6$$

$-2x^2 - 6x + 20 = 0$

$$x = \frac{-(-6) \pm \sqrt{(-6)^2 - 4(-2)(20)}}{2(-2)} = \frac{6 \pm \sqrt{196}}{-4} = \frac{6 \pm 14}{-4}$$

$$x_1 = \frac{6 + 14}{-4} = -5$$
$$x_2 = \frac{6 - 14}{-4} = 2$$

$-3x^2 - 3x + 18 = 0$

$$x = \frac{-(-3) \pm \sqrt{(-3)^2 - 4(-3)(18)}}{2(-3)} = \frac{3 \pm \sqrt{225}}{-6} = \frac{3 \pm 15}{-6}$$

$$x_1 = \frac{3 + 15}{-6} = -3$$
$$x_2 = \frac{3 - 15}{-6} = 2$$

$3x^2 + 9x - 30 = 0$

$$x = \frac{-(9) \pm \sqrt{(9)^2 - 4(3)(-30)}}{2(3)} = \frac{-9 \pm \sqrt{441}}{6} = \frac{-9 \pm 21}{6}$$

$$x_1 = \frac{-9 + 21}{6} = 2$$
$$x_2 = \frac{-9 - 21}{6} = -5$$

$-2x^2 + 18x - 16 = 0$

$$x = \frac{-(18) \pm \sqrt{(18)^2 - 4(-2)(-16)}}{2(-2)} = \frac{-18 \pm \sqrt{196}}{-4} = \frac{-18 \pm 14}{-4}$$

$$x_1 = \frac{-18 + 14}{-4} = 1$$
$$x_2 = \frac{-18 - 14}{-4} = 8$$

$-x^2 - 15x - 56 = 0$

$$x = \frac{-(-15) \pm \sqrt{(-15)^2 - 4(-1)(-56)}}{2(-1)} = \frac{15 \pm \sqrt{1}}{-2} = \frac{15 \pm 1}{-2}$$

$$x_1 = \frac{15 + 1}{-2} = -8$$
$$x_2 = \frac{15 - 1}{-2} = -7$$

$3x^2 + 42x + 147 = 0$

$$x = \frac{-(42) \pm \sqrt{(42)^2 - 4(3)(147)}}{2(3)} = \frac{-42 \pm \sqrt{0}}{6} = \frac{-42 \pm 0}{6}$$

$$x_1 = \frac{-42 + 0}{6} = -7$$
$$x_2 = \frac{-42 - 0}{6} = -7$$