

15a)  $x^2 - 7x + 12 = 0$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-(-7) \pm \sqrt{(-7)^2 - 4 \cdot 1 \cdot 12}}{2 \cdot 1} =$$

$$= \frac{7 \pm \sqrt{49 - 48}}{2} = \frac{7 \pm 1}{2} = \begin{cases} x_1 = \frac{8}{2} = 4 \\ x_2 = \frac{6}{2} = 3 \end{cases} \quad \boxed{\begin{matrix} x_1 = 4 \\ x_2 = 3 \end{matrix}}$$

15b)  $x^2 - 9x + 18 = 0$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-(-9) \pm \sqrt{(-9)^2 - 4 \cdot 18}}{2 \cdot 1} =$$

$$= \frac{9 \pm \sqrt{81 - 72}}{2} = \frac{9 \pm \sqrt{9}}{2} = \frac{9 \pm 3}{2} = \begin{cases} x_1 = 6 \\ x_2 = 3 \end{cases}$$

15c)  $2x^2 - 8x + 8 = 0$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-(-8) \pm \sqrt{64 - 4 \cdot 2 \cdot 8}}{2 \cdot 2} =$$

$$= \frac{8 \pm \sqrt{64 - 64}}{4} = \frac{8}{4} = 2 \quad \boxed{x = 2}$$

15d)  $x^2 - 9x + 14 = 0$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-(-9) \pm \sqrt{(-9)^2 - 4 \cdot 1 \cdot 14}}{2 \cdot 1} =$$

$$= \frac{9 \pm \sqrt{81 - 56}}{2} = \frac{9 \pm \sqrt{25}}{2} = \frac{9 \pm 5}{2} = \begin{cases} x_1 = \frac{14}{2} = 7 \\ x_2 = \frac{4}{2} = 2 \end{cases}$$

15 e)  $x^2 - 6x + 8 = 0$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-(-6) \pm \sqrt{(-6)^2 - 4 \cdot 1 \cdot 8}}{2 \cdot 1}$$

$$= \frac{6 \pm \sqrt{36 - 32}}{2} = \frac{6 \pm \sqrt{4}}{2} = \frac{6 \pm 2}{2} = \begin{cases} x_1 = 4 \\ x_2 = 2 \end{cases}$$

15 f)  $3x^2 + 12x + 9 = 0$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-12 \pm \sqrt{144 - 108}}{2 \cdot 3}$$

$$= \frac{-12 \pm \sqrt{36}}{6} = \frac{-12 \pm 6}{6} = \begin{cases} x_1 = \frac{-6}{6} = -1 \\ x_2 = \frac{-18}{6} = -3 \end{cases}$$

16 a)

$x^2 - x = 20 \parallel x^2 - x - 20 = 0$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-1 \pm \sqrt{-1^2 - 4 \cdot 1 \cdot -20}}{2 \cdot 1}$$

$$= \frac{-1 \pm \sqrt{1 + 80}}{2} = \frac{-1 \pm \sqrt{81}}{2} = \frac{-1 \pm 9}{2} = \begin{cases} x_1 = 4 \\ x_2 = -5 \end{cases}$$

16 b)  $2x^2 = 48 - 10x \Rightarrow 2x^2 + 10x - 48 = 0$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-10 \pm \sqrt{10^2 - 4 \cdot 2 \cdot -48}}{2 \cdot 2}$$

$$= \frac{-10 \pm \sqrt{100 + 384}}{4} = \frac{-10 \pm \sqrt{484}}{4} = \frac{-10 \pm 22}{4} = \begin{cases} \frac{12}{4} = 3 \\ \frac{-32}{4} = -8 \end{cases}$$

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$$16c) 3x^2 - 8 = -2x \implies 3x^2 + 2x - 8 = 0$$

$$\begin{aligned} x &= \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-2 \pm \sqrt{2^2 - 4 \cdot 3 \cdot -8}}{2 \cdot 3} = \\ &= \frac{-2 \pm \sqrt{4 + 96}}{6} = \frac{-2 \pm \sqrt{100}}{6} = \frac{-2 \pm 10}{6} = \\ &= \begin{cases} \frac{8}{6} = \frac{4}{3} \\ \frac{-12}{6} = -2 \end{cases} \end{aligned}$$

$$16d) x^2 + 9 = 10x \implies x^2 - 10x + 9 = 0$$

$$\begin{aligned} x &= \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-(-10) \pm \sqrt{(-10)^2 - 4 \cdot 1 \cdot 9}}{2 \cdot 1} = \\ &= \frac{10 \pm \sqrt{100 - 36}}{2} = \frac{10 \pm \sqrt{64}}{2} = \frac{10 \pm 8}{2} = \begin{cases} \frac{18}{2} = \underline{\underline{9}} \\ \frac{2}{2} = \underline{\underline{1}} \end{cases} \end{aligned}$$