



CAMI Mathematics: Grade 11

GRADE 11 Solving equations with surds

11.4 Solving equations with surds

1. Solve for x

(a) $\sqrt{-2x+8} = x$

(b) $\sqrt{x+30} = x$

(c) $\sqrt{2x+15} = x$

(d) $\sqrt{20-x} = x$

(e) $\sqrt{-3x+18} = x$

2. Solve for x

(a) $\sqrt{-2x+14} = x-3$

(b) $\sqrt{3x+22} = x+4$

(c) $\sqrt{-8x+16} = x-2$

(d) $\sqrt{10x+24} = x+4$



MEMO

1. Solve for x [4.2.8.1]

(a)

$$\sqrt{-2x+8} = x$$

$$(\sqrt{-2x+8})^2 = (x)^2$$

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

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

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

$$x \neq -4$$

$$x = 2$$

(b)

$$\sqrt{x+30} = x$$

$$(\sqrt{x+30})^2 = (x)^2$$

$$x+30 = x^2$$

$$x^2 - x - 30 = 0$$

$$(x-6)(x+5) = 0$$

$$x = 6$$

$$x \neq -5$$

(c)

$$\sqrt{2x+15} = x$$

$$(\sqrt{2x+15})^2 = (x)^2$$

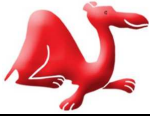
$$2x+15 = x^2$$

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

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

$$x = 5$$

$$x \neq -3$$



CAMI Mathematics: Grade 11

(d)

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

$$(\sqrt{20-x})^2 = (x)^2$$

$$20-x = x^2$$

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

$$(x+5)(x-4) = 0$$

$$x \neq -5$$

$$x = 4$$

(e)

$$\sqrt{-3x+18} = x$$

$$(\sqrt{-3x+18})^2 = (x)^2$$

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

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

$$(x+6)(x-3) = 0$$

$$x \neq -6$$

$$x = 3$$

2. Solve for x [4.2.8.2]

(a)

$$\sqrt{-2x+14} = x-3$$

$$(\sqrt{-2x+14})^2 = (x-3)^2$$

$$-2x+14 = x^2 - 6x + 9$$

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

$$(x-5)(x+1) = 0$$

$$x = 5$$

$$x \neq -1$$



CAMI Mathematics: Grade 11

(b)

$$\sqrt{3x+22} = x+4$$

$$(\sqrt{3x+22})^2 = (x+4)^2$$

$$3x+22 = x^2 + 8x+16$$

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

$$(x+6)(x-1) = 0$$

$$x \neq -6$$

$$x = 1$$

(c)

$$\sqrt{-8x+16} = x-2$$

$$(\sqrt{-8x+16})^2 = (x-2)^2$$

$$-8x+16 = x^2 - 4x+4$$

$$x^2 + 4x - 12 = 0$$

$$(x+6)(x-2) = 0$$

$$x \neq -6$$

$$x = 2$$

(d)

$$\sqrt{10x+24} = x+4$$

$$(\sqrt{10x+24})^2 = (x+4)^2$$

$$10x+24 = x^2 + 8x+16$$

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

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

$$x = 4$$

$$x = -2$$