1. Solve using the square root property: $(3x-2)^2 = 25$

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

then

$$x = \frac{2+5}{3} \qquad x = \frac{2-5}{3}$$
$$x = \frac{7}{3} \qquad x = \frac{-3}{3}$$
$$x = -1$$

2. Solve using the square root property: $(7x-1)^2 = 32$

$$(7x-1)^2 = 32$$
$$7x-1 = \pm\sqrt{32}$$
$$7x-1 = \pm\sqrt{2\cdot 2\cdot 2\cdot 2\cdot 2}$$
$$7x-1 = \pm 2\cdot 2\sqrt{2}$$
$$7x-1 = \pm 4\sqrt{2}$$
$$7x = 1 \pm 4\sqrt{2}$$
$$\frac{7x}{7} = \frac{1\pm 4\sqrt{2}}{7}$$
$$x = \frac{1\pm 4\sqrt{2}}{7}$$

3. Solve using the square root property: $-5(2x+3)^2 = 125$

$$-5(2x+3)^2 = 125$$
$$\frac{-5(2x+3)^2}{-5} = \frac{125}{-5}$$
$$(2x+3)^2 = -25$$
$$2x+3 = \pm\sqrt{-25}$$
$$2x+3 = \pm\sqrt{-1\cdot 5\cdot 5}$$
$$2x+3 = \pm 5i$$
$$2x = -3 \pm 5i$$
$$\frac{2x}{2} = \frac{-3}{2} \pm \frac{5}{2}i$$
$$x = \frac{-3}{2} \pm \frac{5}{2}i$$

4. Solve using completing the square: $x^2 - 10x + 2 = 0$

$$x^2 - 10x + 2 = 0$$
$$x^2 - 10x = -2$$
$$\textit{then}\ \left(-10\cdot\frac{1}{2}\right)^2 = (-5)^2 = 25$$
$$x^2 - 10x + 25 = -2 + 25$$
$$x^2 - 10x + 25 = 23$$
$$(x-5)^2 = 23$$
$$x - 5 = \pm\sqrt{23}$$
$$x = 5 \pm \sqrt{23}$$

5. Solve using completing the square: $x^2 + 8x - 1 = 0$

$$x^2 + 8x - 1 = 0$$
$$x^2 + 8x = 1$$
$$\text{then } \left(8 \cdot \frac{1}{2}\right)^2 = (4)^2 = 16$$
$$x^2 + 8x + 16 = 1 + 16$$
$$x^2 + 8x + 16 = 17$$
$$(x+4)^2 = 17$$
$$x + 4 = \pm\sqrt{17}$$
$$x = -4 \pm \sqrt{17}$$

6. Solve using the quadratic formula: $x^2 + 4x + 7 = 0$

$$x^2 + 4x + 7 = 0$$
$$a = 1, b = 4, c = 7$$
$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$
$$x = \frac{-(4) \pm \sqrt{(4)^2 - 4(1)(7)}}{2(1)}$$
$$x = \frac{-4 \pm \sqrt{16 - 28}}{2}$$
$$x = \frac{-4 \pm \sqrt{-12}}{2}$$
$$x = \frac{-4 \pm \sqrt{-1 \cdot 2 \cdot 2 \cdot 3}}{2}$$
$$x = \frac{-4 \pm 2i\sqrt{3}}{2}$$
$$x = \frac{-4}{2} \pm \frac{2\sqrt{3}}{2} i$$
$$= -2 \pm \sqrt{3}i$$

7. Solve using the quadratic formula: $x^2 - x + 8 = 0$

$$x^2 - x + 8 = 0$$
$$a = 1, b = -1, c = 8$$
$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$
$$x = \frac{-(-1) \pm \sqrt{(-1)^2 - 4(1)(8)}}{2(1)}$$
$$x = \frac{1 \pm \sqrt{1 - 32}}{2}$$
$$x = \frac{1 \pm \sqrt{-31}}{2}$$
$$x = \frac{1 \pm i\sqrt{31}}{2}$$
$$x = \frac{1}{2} \pm \frac{\sqrt{31}}{2} i$$

8. Solve using the quadratic formula: $6x^2 - 2x + 3 = 0$

$$6x^2 - 2x + 3 = 0$$
$$a = 6, b = -2, c = 3$$
$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$
$$x = \frac{-(-2) \pm \sqrt{(-2)^2 - 4(6)(3)}}{2(6)}$$
$$x = \frac{2 \pm \sqrt{4 - 72}}{12}$$
$$x = \frac{2 \pm \sqrt{-68}}{12}$$
$$x = \frac{2 \pm \sqrt{-1 \cdot 2 \cdot 2 \cdot 17}}{12}$$
$$x = \frac{2 \pm 2i\sqrt{17}}{12}$$
$$x = \frac{2}{12} \pm \frac{2\sqrt{17}}{12} i$$
$$x = \frac{1}{6} \pm \frac{\sqrt{17}}{6} i$$

9. Solve using the u-substitution: $x^4 - 9x^2 + 20 = 0$

$x^4 - 9x^2 + 20 = 0$
$u^2 - 9u + 20 = 0$
$(u-4)(u-5) = 0 \quad (PSD)$
then
$u - 4 = 0 \quad u - 5 = 0$
$u = 4 \qquad u = 5$
$x^2 = 4 \qquad x^2 = 5$
$x = \pm\sqrt{4} \quad x = \pm\sqrt{5}$
$x = \pm 2$

10. Solve using the u-substitution: $x^4 + 8x^2 - 20 = 0$

$x^4 + 8x^2 - 20 = 0$
$u^2 + 8u - 20 = 0$
$(u+10)(u-2) = 0 \quad (PSD)$
then
$u + 10 = 0 \qquad u - 2 = 0$
$u = -10 \qquad u = 2$
$x^2 = -10 \qquad x^2 = 2$
$x = \pm\sqrt{-10} \quad x = \pm\sqrt{2}$
$x = \pm i\sqrt{10}$