Solve by using the Zero Product Property: do not use decimals in your answers.

1) $x^2 + 3x = 0$

First factor the left-hand side: all we can do is to factor out the GCF

$x(x + 3) = 0$

From the Zero Product Property we infer that

either $x = 0$ or $x + 3 = 0 \implies x = -3$ Answer: $x = 0$ or $x = -3$

If you want to write the answer as a solution set, it would be $\{0, -3\}$

2) $16x^2 - 9 = 0$

First factor the left-hand side: this is a difference of squares

$(4x - 3)(4x + 3) = 0$

From the Zero Product Property we infer that

either $4x - 3 = 0$ or $4x + 3 = 0$

If $4x - 3 = 0$

then $4x = 3 \implies x = \frac{3}{4}$

If $4x + 3 = 0$

then $4x = -3 \implies x = -\frac{3}{4}$

Answer: $x = \frac{3}{4}$ or $x = -\frac{3}{4}$

If you want to write the answer as a solution set, it would be $\{\frac{3}{4}, -\frac{3}{4}\}$

Important note: make sure that you write $-\frac{3}{4}$ rather than $\frac{-3}{4}$. The first one is a number (a negative rational number); the second one is a division problem!

3) $2x^2 - 7x + 5 = 0$

First factor the left-hand side: we use the AC method. We want to numbers whose product is 10 and which add up to -7. By experimentation, the numbers are -2 and -5. Use them as coefficients to split the middle term:

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

Factor by grouping:

$2x(x-1) - 5(x-1) = 0$

$(x-1)(2x-5) = 0$

From the Zero Product Property we infer that

either $x - 1 = 0$ or $2x - 5 = 0$

If $x - 1 = 0$ then $x = 1$

If $2x - 5 = 0$

then $2x = 5 \implies x = \frac{5}{2}$

Answer: $x = 1$ or $x = \frac{5}{2}$

If you want to write the answer as a solution set, it would be $\{1, \frac{5}{2}\}$