Plus or Minus

QE02-V1 · storyboard · QE02 Plus or minus: x² = k. Read each picture with its sentences.

Picture 1

Solve $2x^2 - 50 = 0$.

$2x^2 = 50$ add 50

$x^2 = 25$ divide by 2

$\boxed{x = \pm 5}$ $5^2 = 25$ and $(-5)^2 = 25$

1. Solve 2 x squared minus 50 equals 0.
2. Add 50 to both sides.
3. Then divide by 2: x squared is 25.
4. Which numbers square to 25?
5. 5, and also negative 5.
6. So x equals plus or minus 5.

Picture 2

Solve $3x^2 = 60.$

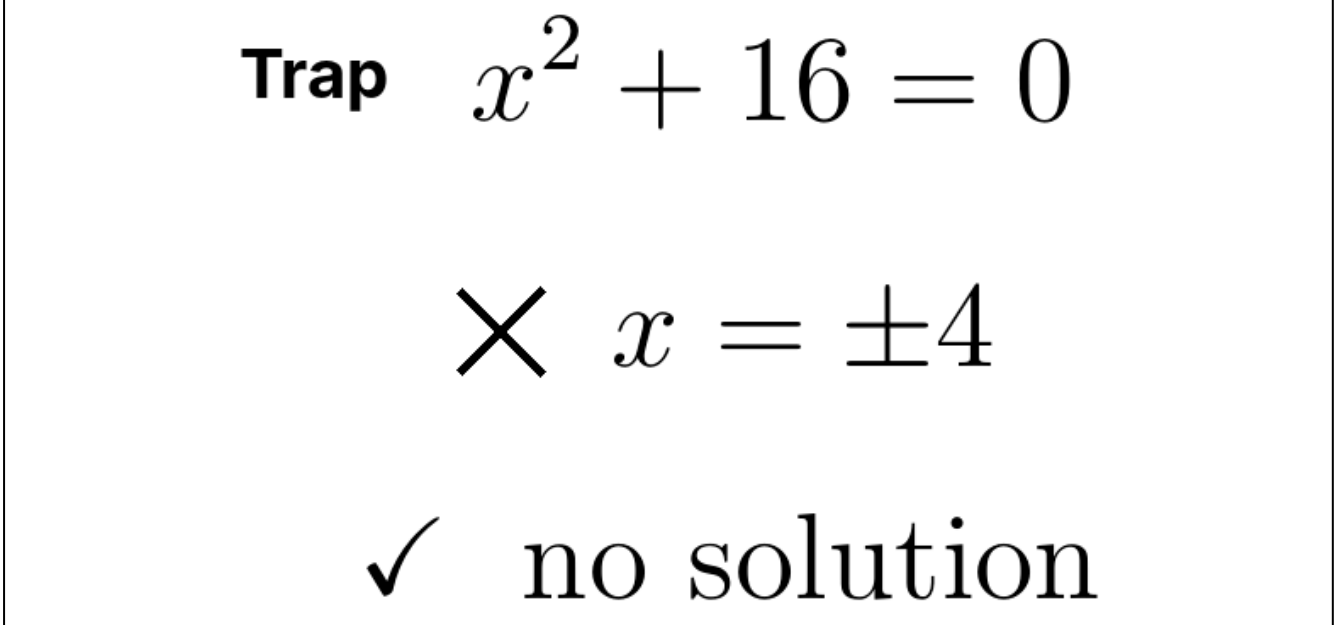
$x^2 = 20$ divide by 3

$x = \pm\sqrt{20}$ 20 is not a perfect square

$= \boxed{\pm 2\sqrt{5}}$ $20 = 4 \times 5$

7. Solve 3 x squared equals 60.
8. Divide by 3: x squared is 20.
9. 20 is not a perfect square, so the roots stay as roots: x equals plus or minus root 20.
10. And 20 is 4 times 5, so root 20 is 2 root 5.
11. Both forms are right.

Picture 3



12. Watch for the trap: x squared plus 16 equals 0 does not give plus or minus 4.
13. It means x squared equals negative 16, and a square is never negative.
14. So there is no solution.

Picture 4

Trap $x^2 = 81$

$\times \; x = 9$

$\checkmark \quad x = 9 \text{ or } x = -9$

15. Another trap: x squared equals 81 does not give only 9.
16. Negative 9 also squares to 81: x equals 9 or x equals negative 9.