

Teacher Notes

3.1.1 How can I solve the equation?

NOTES



Strategies for Solving Equations

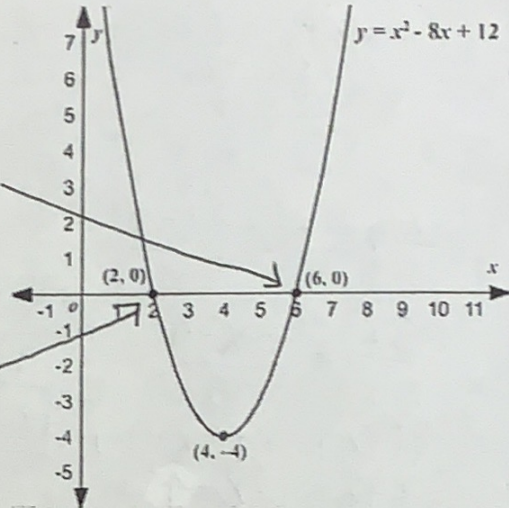
Solving Equations Graphically

Solutions can be found on a graph by looking at the x -intercepts

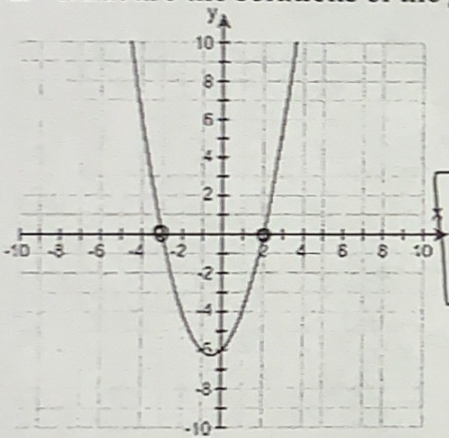
EXAMPLE

$$x = 6$$

$$x = 2$$

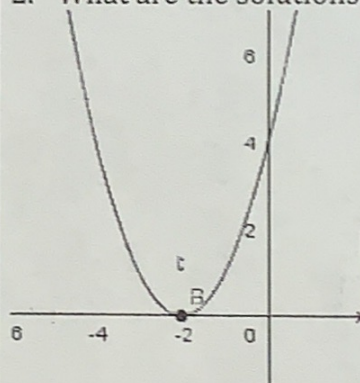


1. What are the solutions of the graph below?



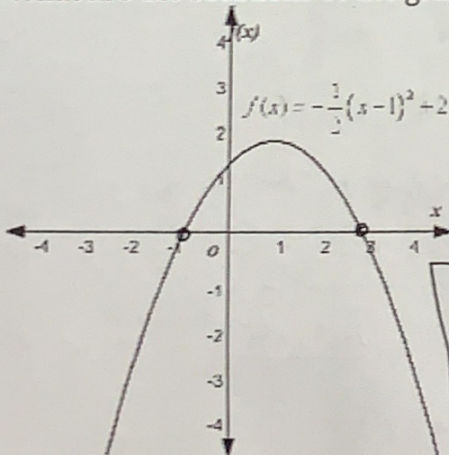
$$\begin{aligned} x &= -3 \\ x &= 2 \end{aligned}$$

2. What are the solutions of the graph below?



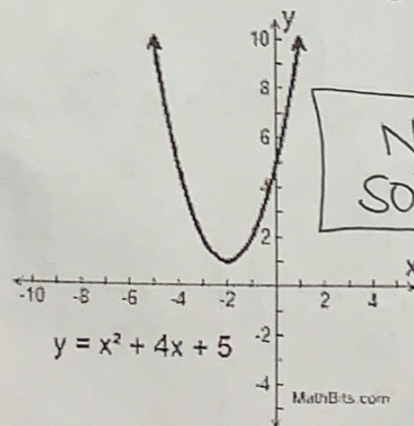
$$x = -2$$

3. What are the solutions of the graph below?



$$\begin{aligned} x &= -1 \\ x &= 3 \end{aligned}$$

4. What are the solutions of the graph below?



NO SOLUTION

P E M D A S

Solving Equations Algebraically

EXAMPLES

d. $3(x+2)^2 - 4 = 23$
 $\quad \quad \quad +4 \quad +4$

$\frac{3(x+2)^2}{3} = \frac{27}{3}$

$\sqrt{(x+2)^2} = \sqrt{9}$

$x+2 = 3$

$\quad -2 \quad -2$
 $\boxed{x=1}$

b. $\frac{x}{4} + \frac{x}{2} = \frac{3x-4}{8}$

$\frac{x}{4} + \frac{2x}{4} = \frac{3x-4}{8}$

$\frac{3x}{4} = \frac{3x-4}{8}$

$8(3x) = 4(3x-4)$

$24x = 12x - 16$
 $-12x \quad -12x$

$\rightarrow 12x = -16$
 $\frac{12x}{12} = \frac{-16}{12}$
 $\boxed{x = -1.3}$

c. $\frac{5(\sqrt{x+2} + 4)}{5} = \frac{20}{5}$

$\sqrt{x+2} + 4 = 4$
 $\quad \quad \quad -4 \quad -4$

$(\sqrt{x+2})^2 = (0)^2$

$x+2 = 0$
 $\quad -2 \quad -2$

$\boxed{x = -2}$

a. $x^2 + 6x = 27$
 $\quad \quad \quad -27 \quad -27$

$x^2 + 6x - 27 = 0$

$(x+9)(x-3) = 0$

$x+9 = 0 \quad x-3 = 0$
 $\quad -9 \quad -9 \quad +3 \quad +3$

$\boxed{x = -9}$

$\boxed{x = 3}$

5. $4(x-5)^2 + 3 = 31$
 $\quad \quad \quad -3 \quad -3$

$\frac{4(x-5)^2}{4} = \frac{28}{4}$

$\sqrt{(x-5)^2} = \sqrt{7}$

$x-5 = 2.64$
 $\quad +5 \quad +5$

$\boxed{x = 7.64}$

6. $3\sqrt{x+6} - 2 = 13$
 $\quad \quad \quad +2 \quad +2$

$\frac{3\sqrt{x+6}}{3} = \frac{15}{3}$

$(\sqrt{x+6})^2 = (5)^2$

$x+6 = 25$
 $\quad -6 \quad -6$

$\boxed{x = 19}$

7. $\frac{2}{5}(\frac{x}{2}) + \frac{5}{2}(\frac{x}{5}) = \frac{x+1}{10}$

$\frac{2x}{10} + \frac{5x}{10} = \frac{x+1}{10}$

$\frac{7x}{10} = \frac{x+1}{10}$

$\frac{10(7x)}{10} = \frac{10(x+1)}{10}$

$7x = x+1$
 $\quad -x \quad -x$

$\rightarrow 6x = 1$
 $\frac{6x}{6} = \frac{1}{6}$
 $\boxed{x = \frac{1}{6}}$

8. $x^2 - 5x = 14$
 $\quad \quad \quad -14 \quad -14$

$x^2 - 5x - 14 = 0$

$(x-7)(x+2) = 0$

$x-7 = 0 \quad x+2 = 0$

$\boxed{x = 7}$

$\boxed{x = -2}$