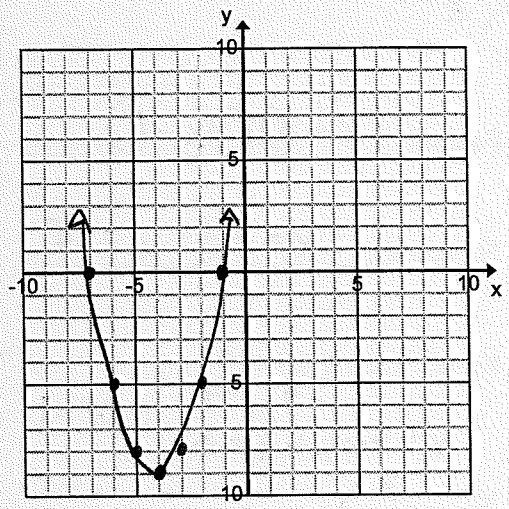
roblems 1 – 4: Solve by Graphing. Show the Graph AND the Solution(s). Round to the nearest hundredth when necessary.

1. $x^2 + 8x + 7 = 0$

x	y
-7	0
-6	-5
-5	-8
-4	-9
-3	-8
-2	-5
-1	0



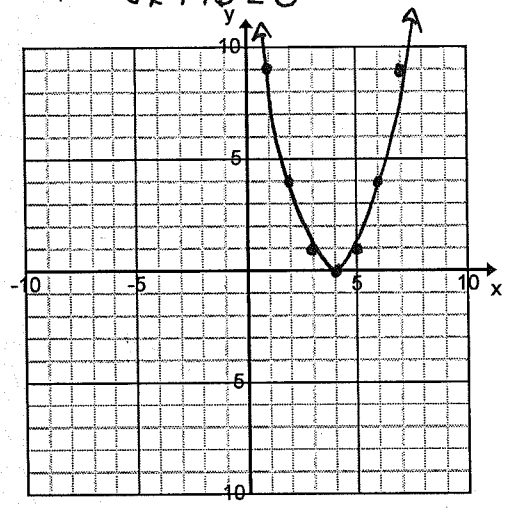
Solution(s): X = -7 X = -1

2. $x^2 - 8x + 10 = -6$

+6 +6

$x^2 - 8x + 16 = 0$

x	y
1	9
2	4
3	1
4	0
5	1
6	4
7	9



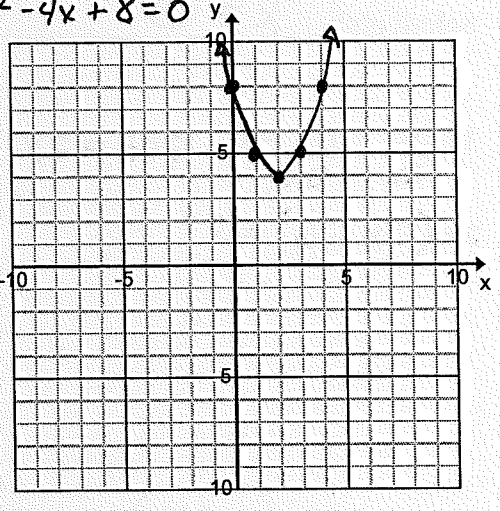
Solution(s): X = 4

3. $x^2 - 4x = -8$

+8 +8

$x^2 - 4x + 8 = 0$

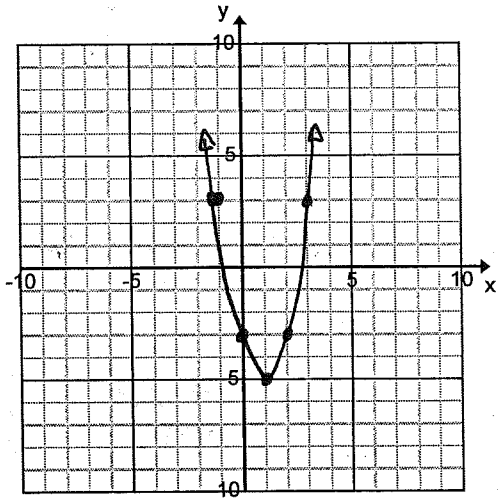
x	y
0	8
1	5
2	4
3	5
4	8



Solution(s): NO REAL SOLUTIONS

4. $2x^2 - 4x - 3 = 0$

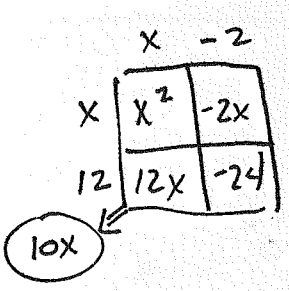
x	y
-1	3
0	-3
1	-5
2	-3
3	3



Solution(s): X = -0.58 X = 2.58

Problems 5 – 10: Solve by Factoring. Show the Factors AND the Solution(s).

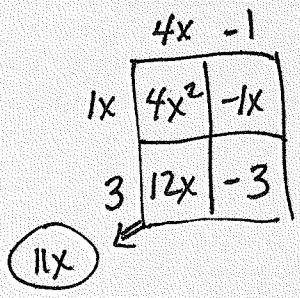
5. $x^2 + 10x - 24 = 0$ GCF = 1



Factors: $(x+12)(x-2)$

Solution(s): $x = -12 \quad x = 2$

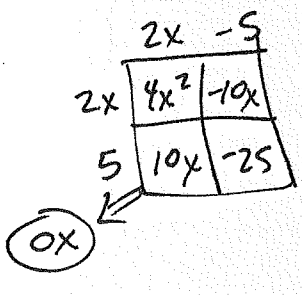
6. $4x^2 + 11x - 3 = 0$ GCF = 1



Factors: $(x+3)(4x-1)$

Solution(s): $x = -3 \quad x = \frac{1}{4}$

7. $4x^2 - 25 = 0$ GCF = 1



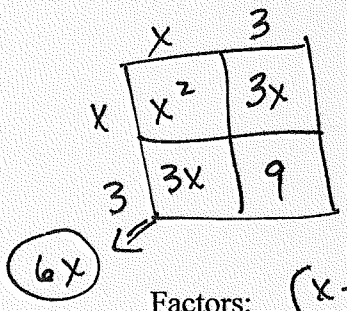
Factors: $(2x+5)(2x-5)$

Solution(s): $x = -\frac{5}{2} \quad x = \frac{5}{2}$

8. $x^2 + 6x + 18 = 9$

$-9 \quad -9$

$x^2 + 6x + 9 = 0$ GCF = 1



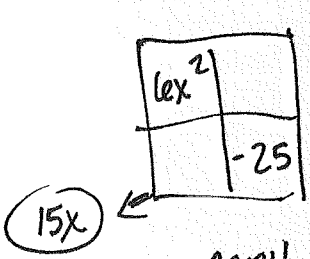
Factors: $(x+3)(x+3)$

Solution(s): $x = -3$

9. $6x^2 + 15x = 25$

$-25 \quad -25$

$6x^2 + 15x - 25 = 0$ GCF = 1



← nothing works

Factors: can't be factored

solved by graphing

Solution(s): $x = 1.14 \quad x = -3.64$

10. $\frac{6x^2}{6x} + \frac{12x}{6x} = \frac{0}{6x}$ GCF = 6x

$6x(1x + 2) = 0$

Factors: $6x(x+2)$

Solution(s): $x = 0 \quad x = -2$

Problems 11 – 16: Simplify.

11. $\sqrt{99}$

$\sqrt{9 \cdot 11}$

$\sqrt{9}\sqrt{11}$

$3\sqrt{11}$

Answer: $3\sqrt{11}$

12. $\sqrt{27}$

$\sqrt{9 \cdot 3}$

$\sqrt{9}\sqrt{3}$

$3\sqrt{3}$

Answer: $3\sqrt{3}$

13. $\sqrt{-44}$

$\sqrt{-1 \cdot 4 \cdot 11}$

$\sqrt{-1}\sqrt{4}\sqrt{11}$

$i \quad 2\sqrt{11}$

Answer: $2i\sqrt{11}$

14. $\sqrt{200}$

$\sqrt{100 \cdot 2}$

$\sqrt{100}\sqrt{2}$

$10\sqrt{2}$

Answer: $10\sqrt{2}$

15. $\sqrt{72}$

$\sqrt{36 \cdot 2}$

$\sqrt{36}\sqrt{2}$

$6\sqrt{2}$

Answer: $6\sqrt{2}$

16. $\sqrt{-98}$

$\sqrt{-1 \cdot 49 \cdot 2}$

$\sqrt{-1}\sqrt{49}\sqrt{2}$

$i \quad 7 \quad \sqrt{2}$

Answer: $7i\sqrt{2}$

Problems 17 – 22: Solve by using Square Roots. You must show your work to receive full credit.

17. $\sqrt{(x+5)^2} = \sqrt{36}$

$x + 5 = \pm 6$

$x + 5 = 6$ $\quad$ $x + 5 = -6$

$-5 \quad -5$ $\quad$ $-5 \quad -5$

$x = 1$ $\quad$ $x = -11$

Solution(s): $x = 1 \quad x = -11$

18. $2(x-1)^2 - 97 = 1$

$+97 \quad +97$

$\frac{2(x-1)^2}{2} = \frac{98}{2}$

$\sqrt{(x-1)^2} = \sqrt{49}$

$x - 1 = \pm 7$

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

$+1 \quad +1$ $\quad$ $+1 \quad +1$

$x = 8$ $\quad$ $x = -6$

Solution(s): $x = 8 \quad x = -6$

Problems 17 – 22 (continued): Solve by using Square Roots. You must show your work.

19. $\sqrt{(x-4)^2} = \sqrt{-36}$

$x - 4 = \pm 6i$

$x - 4 = +6i$ $\quad$ $x - 4 = -6i$

$+4 \quad +4$ $\quad$ $+4 \quad +4$

$x = 4 + 6i$ $\quad$ $x = 4 - 6i$

Solution(s): $x = 4 + 6i \quad x = 4 - 6i$

20. $(x+1)^2 - 4 = 21$

$+4 \quad +4$

$\sqrt{(x+1)^2} = \sqrt{25}$

$x + 1 = \pm 5$

$x + 1 = 5$ $\quad$ $x + 1 = -5$

$-1 \quad -1$ $\quad$ $-1 \quad -1$

$x = 4$ $\quad$ $x = -6$

Solution(s): $x = 4 \quad x = -6$

21. $\sqrt{x^2} = \sqrt{-100}$

$x = \pm 10i$

Solution(s): $x = \pm 10i$

22. $-3x^2 - 6 = 21$

$+6 \quad +6$

$\frac{-3x^2}{-3} = \frac{27}{-3}$

$\sqrt{x^2} = \sqrt{-9}$

$x = \pm 3i$

Solution(s): $x = 3i \quad x = -3i$

23. A rock is thrown upward from the top of a building. The height of the rock can be calculated using the function $h(t) = -16(t-4)^2 + 320$, where h(t) represents the height of the rock after t seconds. After how many seconds does the rock hit the ground. Solve by Square Roots AND by Graphing. Make sure your answers match!

$-16(x-4)^2 + 320 = 0$

$-320 \quad -320$

$\frac{-16(x-4)^2}{-16} = \frac{-320}{-16}$

$\sqrt{(x-4)^2} = \sqrt{20}$

$x - 4 = \pm 4.47$

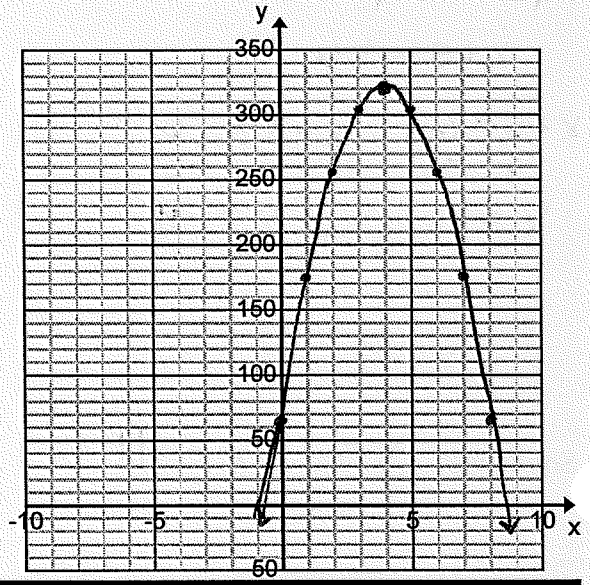
$x - 4 = 4.47$ $\quad$ $x - 4 = -4.47$

$+4 \quad +4$ $\quad$ $+4 \quad +4$

$x = 8.47$ $\quad$ $x = -0.47$

↑ negative time doesn't make sense

x	y
0	64
1	176
2	256
3	304
4	320
5	304
6	256
7	176
8	64



Answer: 8.47 seconds