تجميعة أسئلة الوحدة الأولى functions Quadratic وفق الهيكل الوزاري منهج ريفيل

تاريخ إضافة الملف على موقع المناهج: 10-11-2024 19:43:04

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إعداد: Daher Maysa

التواصل الاجتماعي بحسب الصف الحادي عشر العام

صفحة المناهج الإماراتية على فيسبوك					
المواد على تلغرام	التربية الاسلامية	اللغة العربية	اللغة الانجليزية	الرياضيات	

المزيد من الملفات بحسب الصف الحادي عشر العام والمادة رياضيات في الفصل الأول

1	حل ملزمة تجميعة أسئلة وفق الهيكل الوزاري منهج بريدج
2	تجميعة أسئلة مراجعة وفق الهيكل الوزاري منهج بريدج
3	حل ملزمة أسئلة مراجعة وفق الهيكل الوزاري منهج ريفيل
4	ملزمة أسئلة مراجعة وفق الهيكل الوزاري منهج ريفيل

المزيد من الملفات بحسب الصف الحادي عشر العام والمادة رياضيات في الفصل الأول

5	حل تجميعة أسئلة وفق الهيكل الوزاري حسب منهج بريدج

Grade 11 G

Module 1

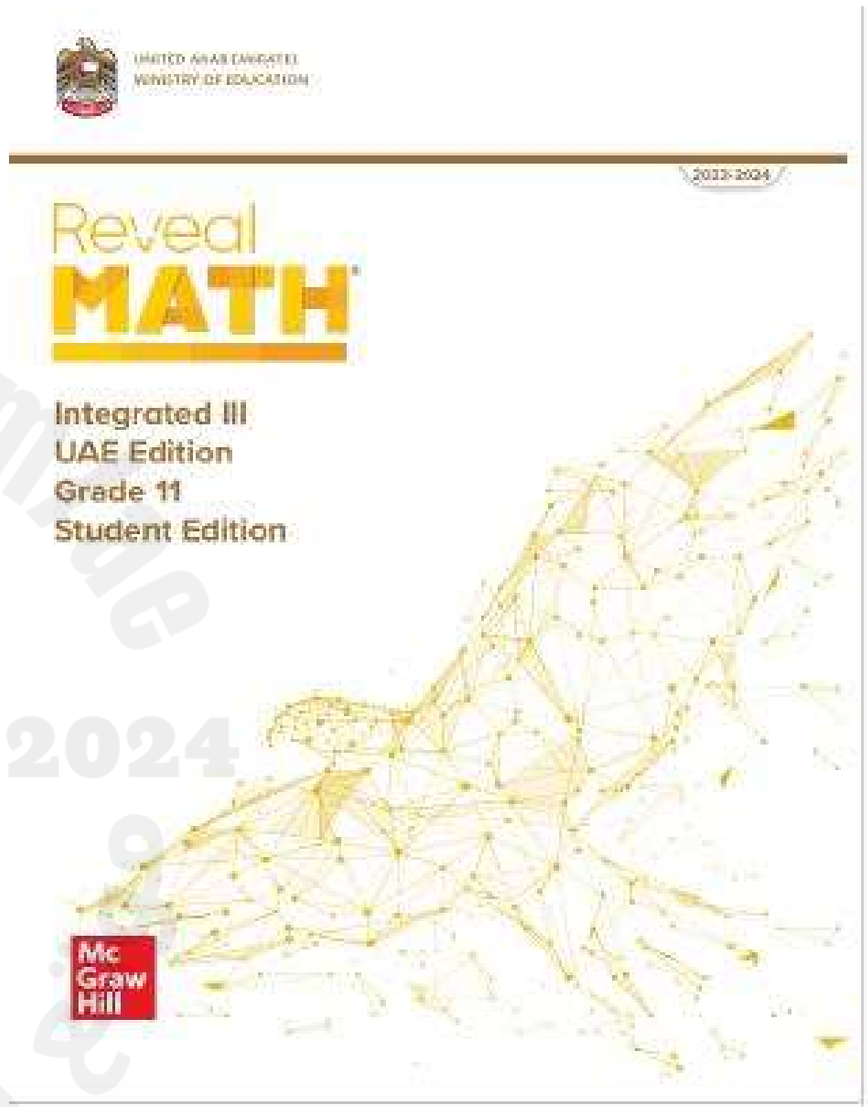
Quadratic Functions

Module 2

Polynomials and Polynomial Functions

Module 3

Polynomial Equations



Done by

Ms : Maysa Daher

Al Tomouh School

Question* السؤال*	Learning Outcome/Performance Criteria** نتاج التعلم/ معايير الأداء**	rence(s) in the Student Book (English Ver المرجع في كتاب الطالب (النسخة الانجليزية)	
		Example/Exercise مثال/تمرين	Page الصفحة
MCQs- الأسئلة الموضوعية			
1	Find and interpret the average rate of change of quadratic functions given symbolically, in tables, and in graphs	Exercises (13-21)	P10
2	Solve quadratic equations by graphing	Exercises (1-10)	P17
3	Solve quadratic equations by graphing	Exercises (50-53)	P19
4	Perform operations with complex numbers	Exercises (1-12)	P25
5	Perform operations with complex numbers	Exercises (25-37)	P25
6	Solve quadratic equations by factoring	Exercises(15-32)	P41
7	Complete the square in the case of a trinomial that is not a perfect square	Exercises (19-24)	P39
8	Solve quadratic equations by completing the square	Exercises (44-49)	P40
9	Solve quadratic inequalities in one variable	Exercises (21-29)	P55
10	Graph polynomial functions and locate their zeros	Example5	P77
11	Find the relative maxima and minima of polynomial functions	Example2	P84
12	Add, subtract, and multiply polynomials	Exercises (30-39)	P98
13	Divide polynomials using synthetic division	Exercises (11-16)	P105
14	Determine whether a binomial is a factor of a polynomial by using synthetic substitution	Exercises (23-30)	P139
15	Graph vertical translations of trigonometric functions.	Exercises(1-10)	P127
16	Graph quadratic functions	Exercises (27-32)	P11
17	Solve quadratic equations by using the Quadratic Formula	Exercises(8-23)	P47
18	Solve quadratic equations by factoring	Exercises (31-34)	P107
19	Use Pascal's Triangle to write binomial expansions	Exercises (1-12)	P111
20	Factorise polynomials	Example2	P120
FRQ- الأسئلة المقالية			

* Questions might appear in a different order in the actual exam.

* تظهر الأسئلة بترتيب مختلف في الامتحان الفعلي.

** As it appears in the textbook, LMS, and (Main_IP).

** وردت في كتاب الطالب وLMS والبعثة العملية.

Module 1

Quadratic Functions

	What Will You Learn?	**1**
1-1	**Graphing Quadratic Functions**	**3**
	Explore Transforming Quadratic Functions	
1-2	**Solving Quadratic Equations by Graphing**	**13**
	Explore Roots of Quadratic Equations	
1-3	**Complex Numbers**	**21**
	Explore Factoring the Sum of Two Squares	
1-4	**Solving Quadratic Equations by Factoring**	**27**
	Explore Finding the Solutions of Quadratic Equations by Factoring	
1-5	**Solving Quadratic Equations by Completing the Square**	**33**
	Explore Using Algebra Tiles to Complete the Square	
1-6	**Using the Quadratic Formula and the Discriminant**	**43**
	Explore The Discriminant	
1-7	**Quadratic Inequalities**	**51**
	Explore Graphing Quadratic Inequalities	
1-8	**Solving Linear-Nonlinear Systems**	**57**
	Explore Linear-Quadratic Systems	
	Module 1 Review	**67**

Example 4

Determine the average rate of change of $f(x)$ over the specified interval.

13. $f(x) = x^2 - 10x + 5$; interval $[-4, 4]$

14. $f(x) = 2x^2 + 4x - 6$; interval $[-3, 3]$

15. $f(x) = 3x^2 - 3x + 1$; interval $[-5, 5]$

16. $f(x) = 4x^2 + x + 3$; interval $[-2, 2]$

17. $f(x) = 2x^2 - 11$; interval $[-3, 3]$

18. $f(x) = -2x^2 + 8x + 7$; interval $[-4, 4]$

Example 5

Determine the average rate of change of $f(x)$ over the specified interval.

19. interval $[-3, 3]$

x	$f(x)$
−3	0
−2	3
−1	−4
0	−3
1	0
2	5
3	12

20. interval $[-4, 4]$

x	$f(x)$
−4	−27
−2	−3
0	5
2	−3
4	−27

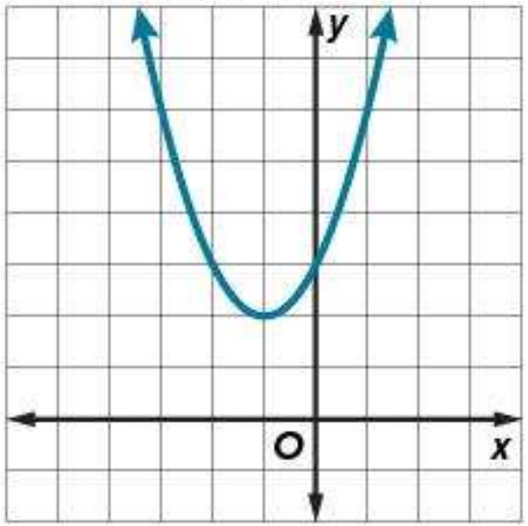
21. interval $[-2, 2]$

x	$f(x)$
−2	−3
−1	−3
0	−1
1	3
2	9

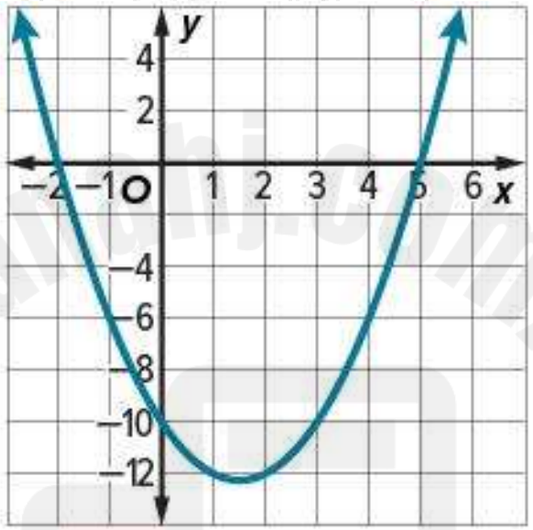
Example 1

Use the related graph of each equation to determine its solutions.

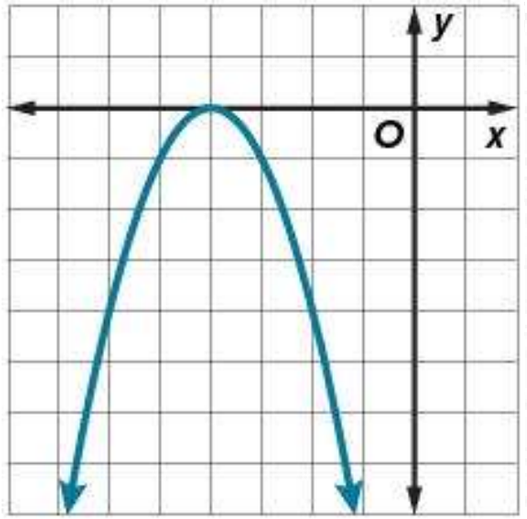
1. $x^2 + 2x + 3 = 0$



2. $x^2 - 3x - 10 = 0$

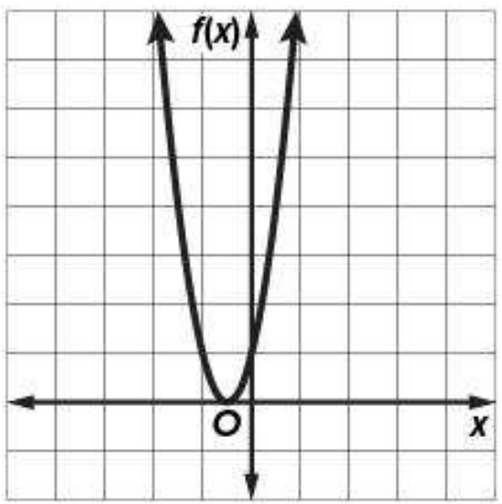


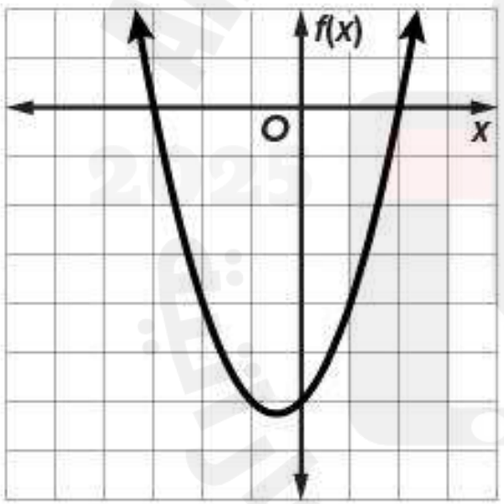
3. $-x^2 - 8x - 16 = 0$

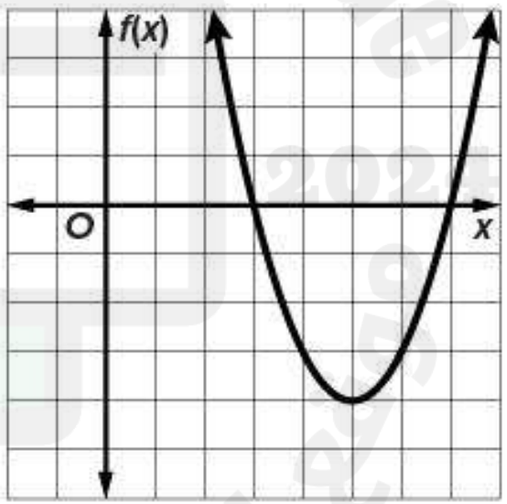


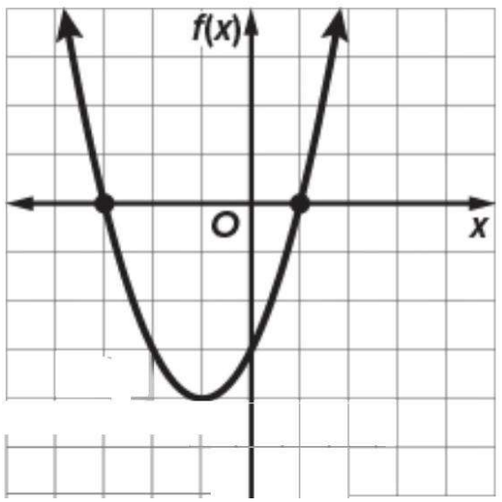
Example 1 **Solve each equation by graphing.**

4. $x^2 - 10x + 21 = 0$



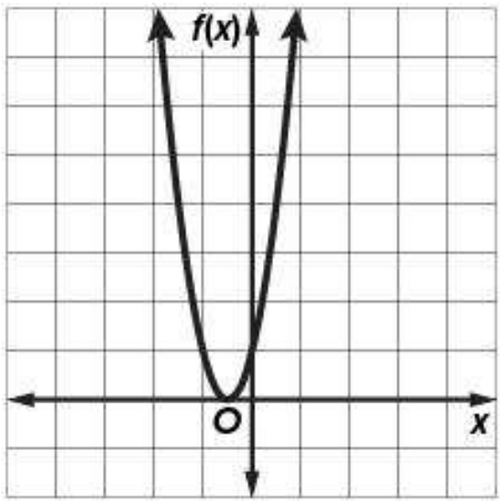


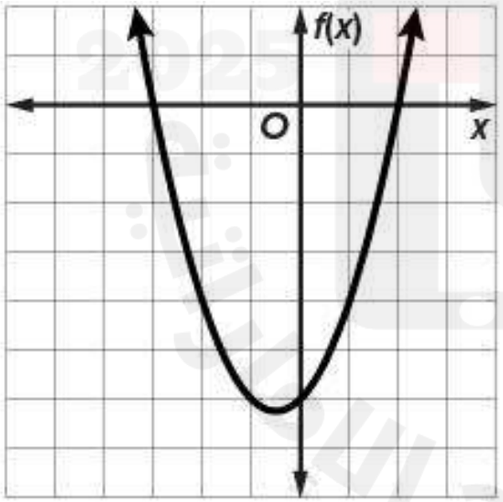


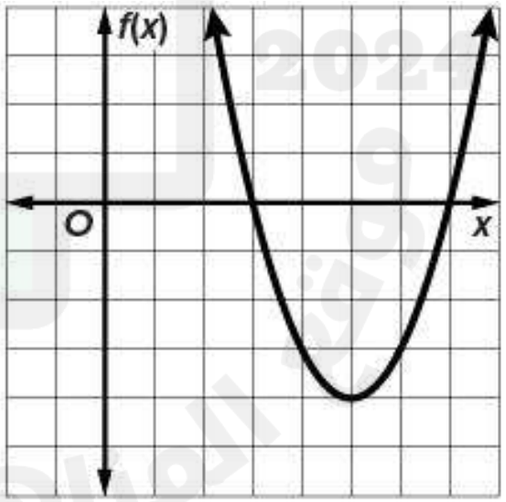


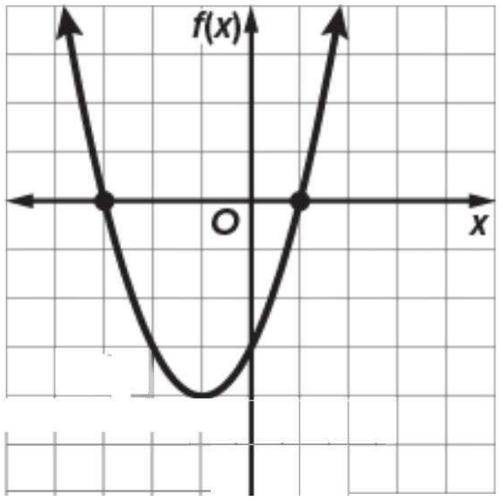
Example 1 **Solve each equation by graphing.**

5. $4x^2 + 4x + 1 = 0$



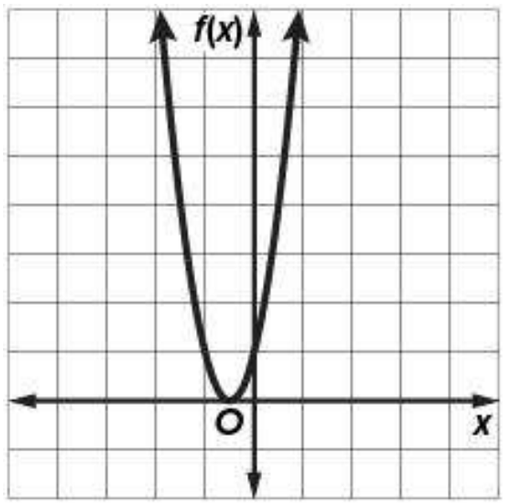


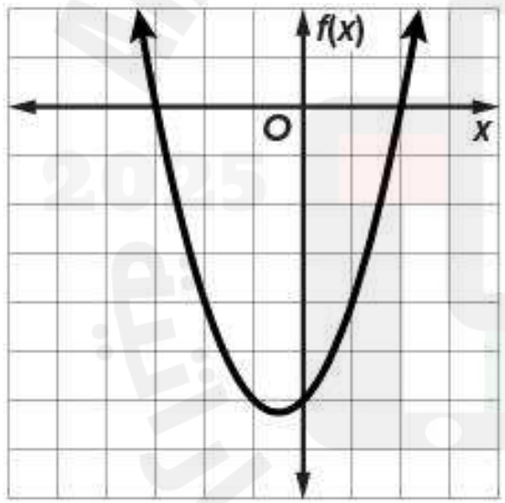


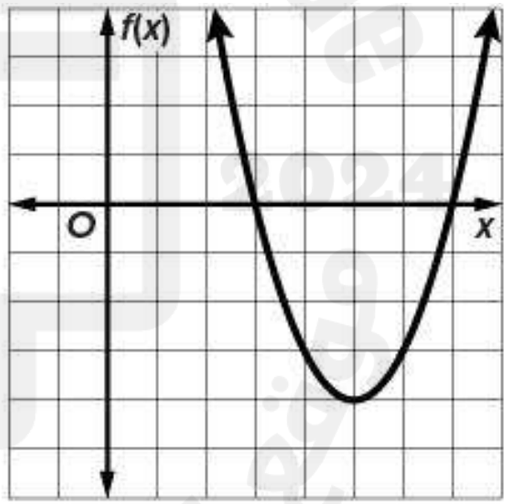


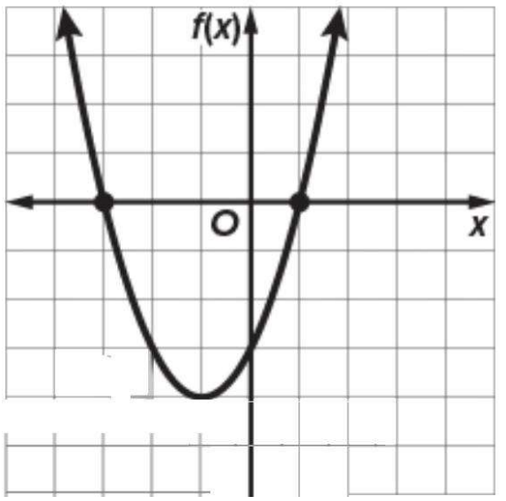
Example 1 **Solve each equation by graphing.**

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



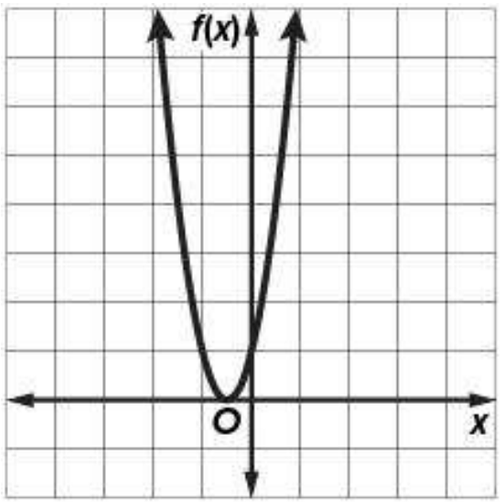


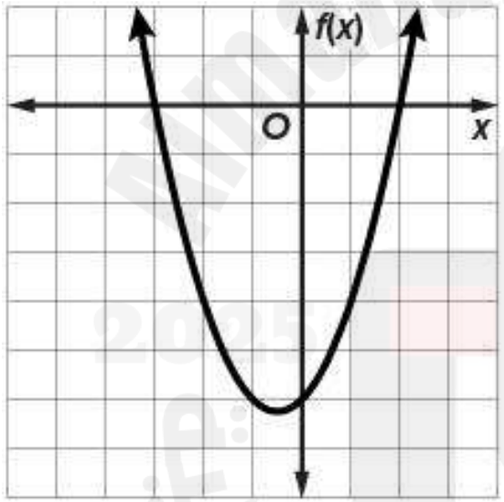


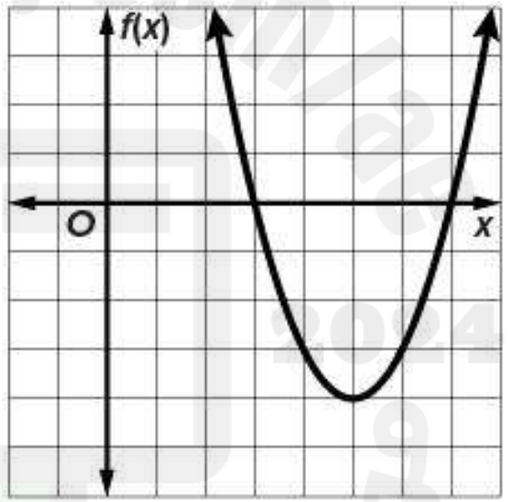


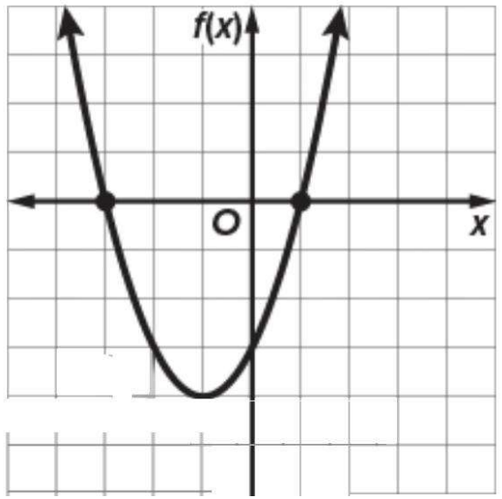
Example 1 **Solve each equation by graphing.**

7. $x^2 + 2x - 3 = 0$



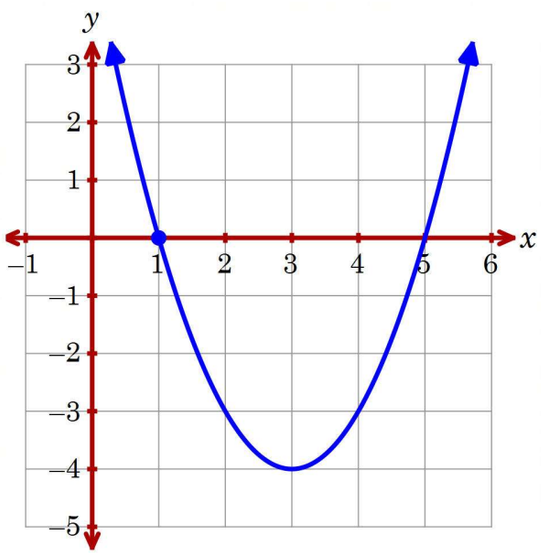


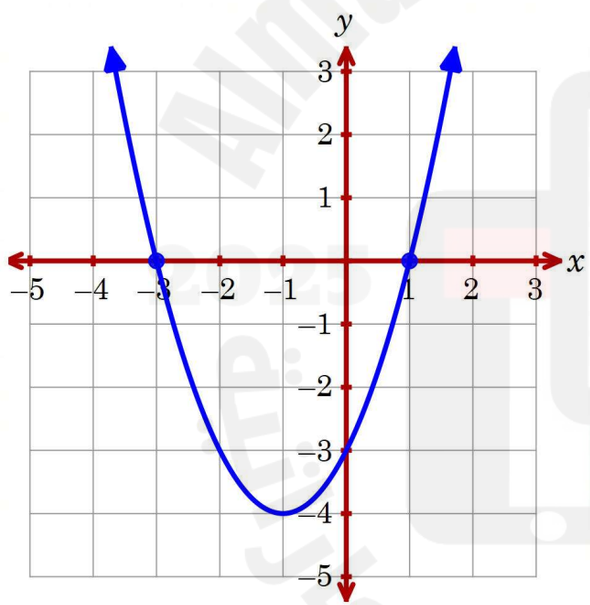


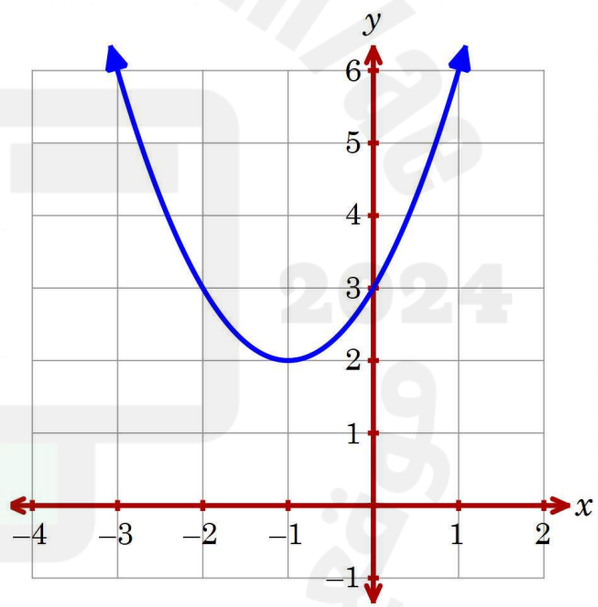


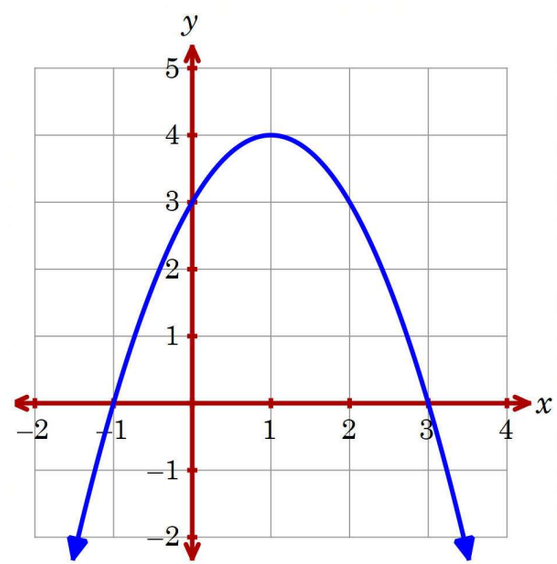
Example 1 **Solve each equation by graphing.**

8. $-x^2 - 6x - 9 = 0$



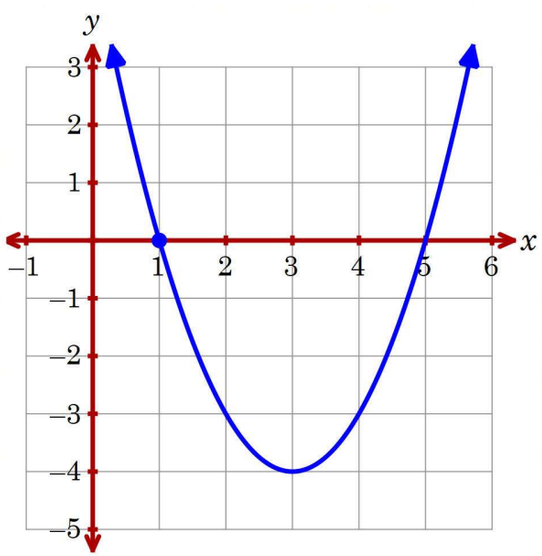


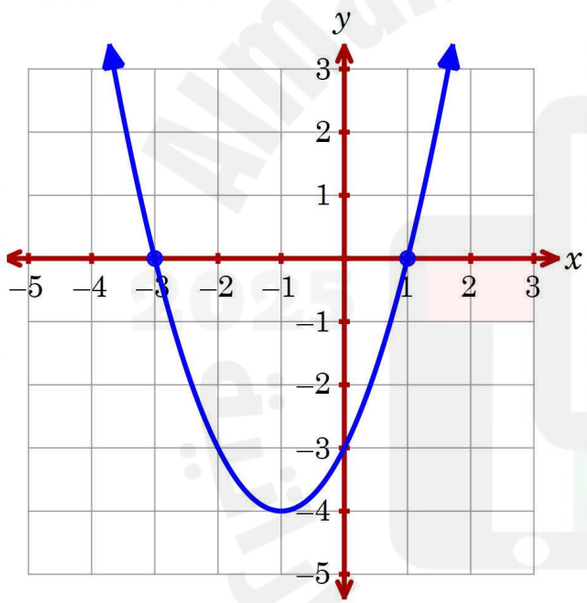


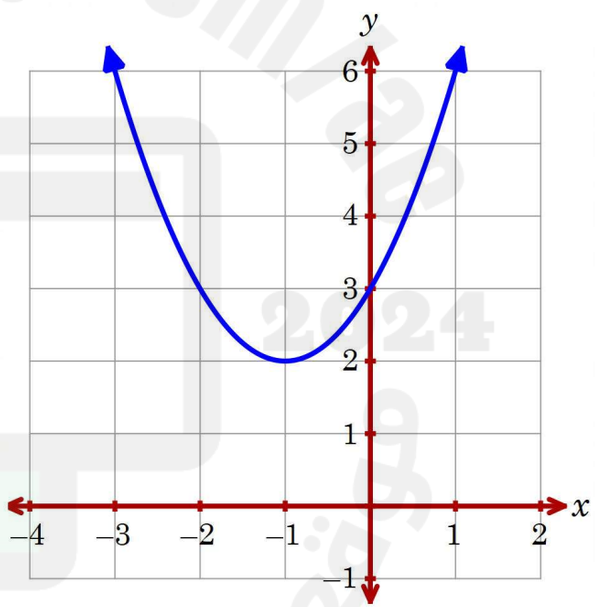


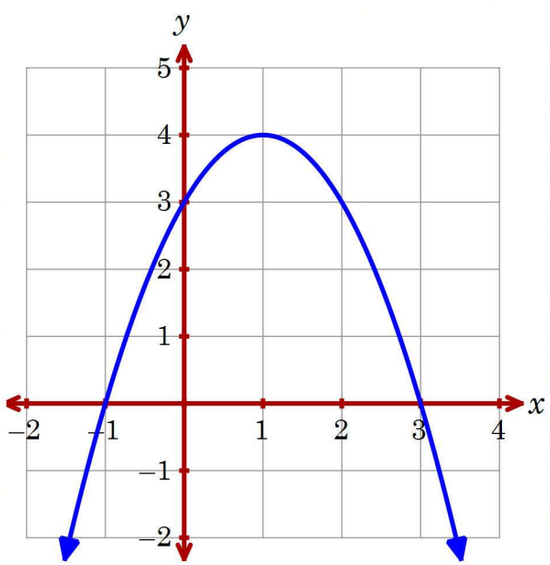
Example 1 **Solve each equation by graphing.**

9. $x^2 - 6x + 5 = 0$



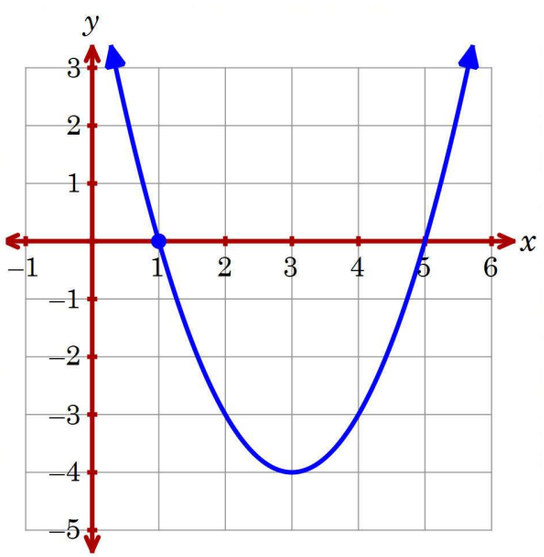


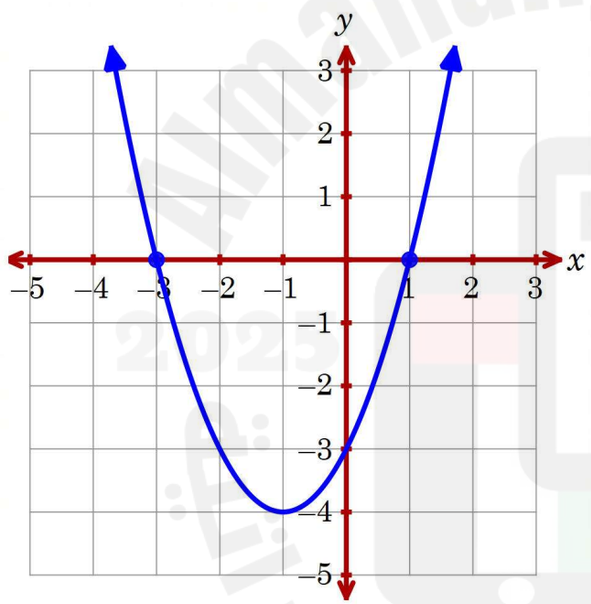


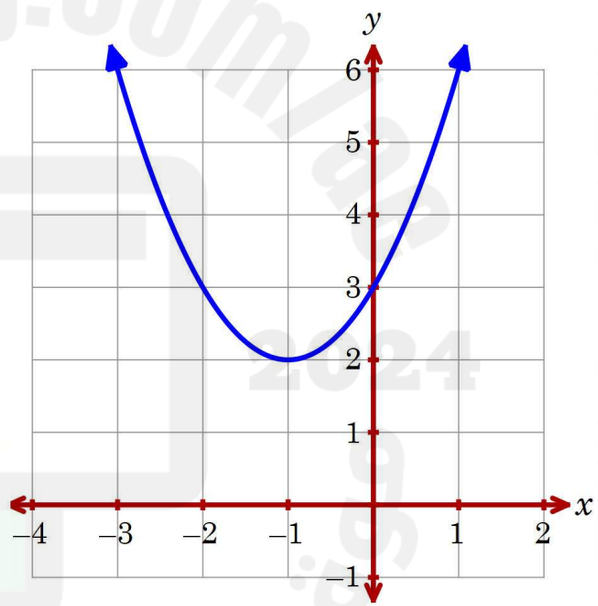


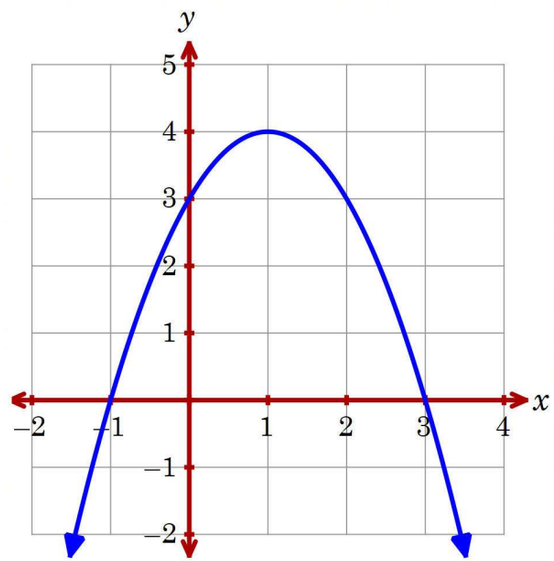
Example 1 **Solve each equation by graphing.**

10. $x^2 + 2x + 3 = 0$









REGULARITY **Use a quadratic equation to find two real numbers that satisfy each situation, or show that no such numbers exist.**

50. Their sum is 4, and their product is −117.

–5 and 17 –9 and 13. 5 and –17 9 and –13.

REGULARITY **Use a quadratic equation to find two real numbers that satisfy each situation, or show that no such numbers exist.**

51. Their sum is 12, and their product is −85.

Let x represent one of the numbers. Then $12 - x$ will represent the other number. So $x(12 - x) = -85$

Solve the equation for 0.

$x(12-x) = -85$ Original equation

$12x - x^2 = -85$ Distributive Property

$-x^2 = -12x - 85$ Subtract $12x$ from each side.

$0 = x^2 - 12x - 85$ Add x^2 to each side.

Find the axis of symmetry.

$x = -\frac{b}{2a}$ Equation of the axis of symmetry

$x = -\frac{-12}{2(1)}$ $a = 1, b = -12$

$x = 6$ Simplify.

x	y
–5	0
–3	–40
–1	–72
1	–96
3	–112
5	–120
6	–121
7	–120
9	–112
11	–96
13	–72
15	–40
17	0

The zeros of the function are –5 and 17.

$x = -5$ and $x = 17$, so $12 - x = 17$ or $12 - x = -5$. Thus, the two numbers with a sum of 12 and a product of –85 are –5 and 17.

–5 and 17 –9 and 13. 5 and –17 9 and –13.

REGULARITY **Use a quadratic equation to find two real numbers that satisfy each situation, or show that no such numbers exist.**

52. Their sum is −13, and their product is 42.

–19 and 11 –7 and –6 19 and –11 7 and 6

REGULARITY **Use a quadratic equation to find two real numbers that satisfy each situation, or show that no such numbers exist.**

53. Their sum is −8, and their product is −209.

–19 and 11 –7 and –6 19 and –11 7 and 6

Examples 1 and 2

Simplify.

1. $\sqrt{-48}$

2. $\sqrt{-63}$

3. $\sqrt{-72}$

4. $\sqrt{-24}$

$$\begin{aligned}\sqrt{-24} &= \sqrt{-1 \cdot 2^2 \cdot 6} \\ &= \sqrt{-1} \cdot \sqrt{2^2} \cdot \sqrt{6} \\ &= 2i\sqrt{6}\end{aligned}$$

5. $\sqrt{-84}$

$$\begin{aligned}\sqrt{-84} &= \sqrt{-1 \cdot 2^2 \cdot 21} \\ &= \sqrt{-1} \cdot \sqrt{2^2} \cdot \sqrt{21} \\ &= 2i\sqrt{21}\end{aligned}$$

6. $\sqrt{-99}$

$$\begin{aligned}\sqrt{-72} &= \sqrt{-1 \cdot 6^2 \cdot 2} \\ &= \sqrt{-1} \cdot \sqrt{6^2} \cdot \sqrt{2} \\ &= 6i\sqrt{2}\end{aligned}$$

Examples 1 and 2

Simplify.

7. $\sqrt{-23} \cdot \sqrt{-46}$

$$\begin{aligned}\sqrt{-23} \cdot \sqrt{-46} &= i\sqrt{23} \cdot i\sqrt{46} \\ &= i^2 \cdot \sqrt{1058} \\ &= -1 \cdot \sqrt{23^2} \cdot \sqrt{2} \\ &= -23\sqrt{2}\end{aligned}$$

8. $\sqrt{-6} \cdot \sqrt{-3}$

9. $\sqrt{-5} \cdot \sqrt{-10}$

$$\begin{aligned}\sqrt{-5} \cdot \sqrt{-10} &= i\sqrt{5} \cdot i\sqrt{10} \\ &= i^2 \cdot \sqrt{50} \\ &= -1 \cdot \sqrt{5^2} \cdot \sqrt{2} \\ &= -5\sqrt{2}\end{aligned}$$

10. $(3i)(-2i)(5i)$

11. i^{11}

12. $4i(-6i)^2$

Examples 5 and 6

Simplify.

25. $(6 + i) + (4 - 5i)$

$2 - 5i \qquad 10 - 4i \qquad 2 + 5i \qquad 10 + 4i$

26. $(8 + 3i) - (6 - 2i)$

$2 - 5i \qquad 10 - 4i \qquad 2 + 5i \qquad 10 + 4i$

27. $(5 - i) - (3 - 2i)$

$$(5-i)-(3-2i)=(5-3)+(-i-(-2i))$$
$$=2+i$$

28. $(-4 + 2i) + (6 - 3i)$

$$(-4+2i)+(6-3i)=(-4+6)+(2i-3i)$$
$$=2-i$$

Examples 5 and 6

Simplify.

29. $(6 - 3i) + (4 - 2i)$

$$(6-3i)+(4-2i)=(6+4)+(-3i-2i)$$
$$=10-5i$$

30. $(-11 + 4i) - (1 - 5i)$

$2-5i \quad -12+9i \quad 12-9i \quad 10+4i$

Examples 5 and 6

Simplify.

31. $(2 + i)(3 - i)$

$7 + i$ $\quad$ $18 - 13i$

$-10i$ $\quad$ $10i - 1$

32. $(5 - 2i)(4 - i)$

$7 + i$ $\quad$ $18 - 13i$

$-10i$ $\quad$ $10i - 1$

33. $(4 - 2i)(1 - 2i)$

$= 4(1) + 4(-2i) - 2i(1) - 2i(-2i)$

$= 4 - 8i - 2i + 4i^2$

$= 4 - 10i + 4(-1)$

$= -10i$

$7 + i$ $\quad$ $18 - 13i$

$-10i$ $\quad$ $10i - 1$

34. **ELECTRICITY** Using the formula $V = CI$, find the voltage V in a circuit when the current $C = 3 - j$ amps and the impedance $I = 3 + 2j$ ohms.

$11 + 3j$ volts $\quad$ $11 - 3j$ volts $\quad$ $-11 + 3j$ volts $\quad$ $18 + 3j$ volts

Example 7

Simplify.

35. $\frac{5}{3+i}$

$\frac{3}{2}+\frac{1}{2}i$ $\quad$ $\frac{3}{2}-\frac{1}{2}i$

$-\frac{13}{2}+\frac{7}{2}i$ $\quad$ $\frac{13}{2}-\frac{7}{2}i$

36. $\frac{7-13i}{2i}$

$\frac{3}{2}+\frac{1}{2}i$ $\quad$ $\frac{3}{2}-\frac{1}{2}i$

$-\frac{13}{2}+\frac{7}{2}i$ $\quad$ $\frac{13}{2}-\frac{7}{2}i$

37. $\frac{6-5i}{3i}$

$\frac{3}{2}+\frac{1}{2}i$ $\quad$ $-\frac{5}{3}-2i$

$-\frac{13}{2}+\frac{7}{2}i$ $\quad$ $\frac{5}{3}-2i$

Examples 5-7

Solve each equation by factoring. Check your solution.

15. $x^2 = 64$

$x^2 = 64$	Original equation
$x^2 - 64 = 0$	Subtract 64 from each side.
$x^2 - 8^2 = 0$	Write in the form $a^2 - b^2$.
$(x + 8)(x - 8) = 0$	Factor the difference of squares.
$x + 8 = 0$ or $x - 8 = 0$	Zero Product Property
$x = -8 \quad x = 8$	Solve.

16. $x^2 - 100 = 0$

17. $289 = x^2$

$289 = x^2$	Original equation
$289 - x^2 = 0$	Subtract x^2 from each side.
$17^2 - x^2 = 0$	Write in the form $a^2 - b^2$.
$(17 + x)(17 - x) = 0$	Factor the difference of squares.
$17 + x = 0$ or $17 - x = 0$	Zero Product Property
$x = -17 \quad x = 17$	Solve.

18. $x^2 + 14 = 50$

19. $x^2 - 169 = 0$

20. $124 = x^2 + 3$

$x = \pm 10 \qquad x = \pm 11$
$x = \pm 13 \qquad x = \pm 6$

$x = \pm 10 \qquad x = \pm 11$
$x = \pm 13 \qquad x = \pm 6$

$x = \pm 10 \qquad x = \pm 11$
$x = \pm 13 \qquad x = \pm 6$

Examples 5-7

Solve each equation by factoring. Check your solution.

27. $x^2 + 12 = -13$

$x^2 + 12 = -13$	Original equation
$x^2 + 25 = 0$	Add 13 to each side.
$x^2 - (-25) = 0$	Write as a difference of squares.
$x^2 - (5i)^2 = 0$	$\sqrt{-25} = 5i$
$(x + 5i)(x - 5i) = 0$	Factor the difference of squares.
$x + 5i = 0$ or $x - 5i = 0$	Zero Product Property
$x = -5i \quad x = 5i$	Solve.

28. $x^2 + 100 = 0$

$x = \pm\frac{5}{6}i \qquad x = \pm 15i$

$x = \pm 2i \qquad x = \pm 10i$

29. $x^2 = -225$

$x = \pm\frac{5}{6}i \qquad x = \pm 15i$

$x = \pm 2i \qquad x = \pm 10i$

30. $x^2 + 4 = 0$

$x = \pm\frac{5}{6}i \qquad x = \pm 15i$

$x = \pm 2i \qquad x = \pm 10i$

31. $36x^2 = -25$

$x = \pm\frac{5}{6}i \qquad x = \pm 15i$

$x = \pm 2i \qquad x = \pm 10i$

32. $64x^2 = -49$

Examples 5-7

Solve each equation by factoring. Check your solution.

21. $4x^2 - 28x + 49 = 0$

$4x^2 - 28x + 49 = 0$ Original equation

$(2x)^2 - 2(2x)(7) + 7^2 = 0$ Factor the perfect square trinomial.

$(2x - 7)^2 = 0$ Zero Product Property

$x = \frac{7}{2}$ Solve.

22. $9x^2 + 6x = -1$

$$9x^2 + 6x = -1$$
$$9x^2 + 6x + 1 = 0$$
$$(3x)^2 + 2(3x)(1) + 1^2 = 0$$
$$(3x + 1)^2 = 0$$
$$x = -\frac{1}{3}$$

23. $16x^2 - 24x + 13 = 4$

$x = -\frac{10}{3}$ $x = -\frac{8}{5}$

$x = -\frac{2}{9}$ $x = \frac{3}{4}$

Examples 5-7

Solve each equation by factoring. Check your solution.

24. $81x^2 + 36x = -4$

$x = -\frac{10}{3}$ $\quad x = -\frac{8}{5}$

$x = -\frac{2}{9}$ $\quad x = \frac{3}{4}$

25. $25x^2 + 80x + 64 = 0$

$x = -\frac{10}{3}$ $\quad x = -\frac{8}{5}$

$x = -\frac{2}{9}$ $\quad x = \frac{3}{4}$

26. $9x^2 + 60x + 95 = -5$

$x = -\frac{10}{3}$ $\quad x = -\frac{8}{5}$

$x = -\frac{2}{9}$ $\quad x = \frac{3}{4}$

Example 4

Find the value of c that makes each trinomial a perfect square. Then write the trinomial as a perfect square trinomial.

19. $x^2 + 10x + c$

Step 1 Find one half of 10. $\frac{10}{2} = 5$

Step 2 Square the result from Step 1. $5^2 = 25$

Step 3 Add the result from Step 2 to $x^2 + 10x$. $x^2 + 10x + 25$

The expression $x^2 + 10x + 25$ can be written as $(x + 5)^2$.

20. $x^2 - 14x + c$

$\frac{81}{4}$ $\frac{25}{4}$ 144 49

21. $x^2 + 24x + c$

$\frac{81}{4}$ $\frac{25}{4}$ 144 49

22. $x^2 + 5x + c$

$\frac{81}{4}$ $\frac{25}{4}$ 144 49

23. $x^2 - 9x + c$

$\frac{81}{4}$ $\frac{25}{4}$ 144 49

24. $x^2 - x + c$

Examples 9 and 10

Write each function in vertex form. Find the axis of symmetry. Then find the vertex, and determine if it is a *maximum* or *minimum*.

44. $y = x^2 + 2x - 5$

$y = x^2 + 2x - 5$ Original equation

$y = (x^2 + 2x) - 5$ Group $ax^2 + bx$.

$y = (x^2 + 2x + 1) - 5 - 1$ Complete the square.

$y = (x + 1)^2 - 6$ Simplify.

45. $y = x^2 + 6x + 1$

$y = (x - 3)^2 - 8$ $y = (x + 3)^2 - 8$

$y = -(x - 2)^2 + 6$ $y = (x - 2)^2 - 6$

46. $y = -x^2 + 4x + 2$

$y = (x - 3)^2 - 8$ $y = (x + 3)^2 - 8$

$y = -(x - 2)^2 + 6$ $y = (x - 2)^2 - 6$

Examples 9 and 10

Write each function in vertex form. Find the axis of symmetry. Then find the vertex, and determine if it is a *maximum* or *minimum*.

47. $y = -x^2 - 8x - 5$

$y = -x^2 - 8x - 5$	Original equation
$y = (-x^2 - 8x) - 5$	Group $ax^2 + bx$.
$y = -(x^2 + 8x) - 5$	Factor out -1.
$y = -(x^2 + 8x + 16) - 5 - (-1)16$	Complete the square.
$y = -(x+4)^2 + 11$	Simplify.

48. $y = 2x^2 + 4x + 3$

$y = 2(x+1)^2 + 1$ $\quad y = 3(x+1)^2 - 4$

$y = 2(x+1)^2 - 1$ $\quad y = 3(x-1)^2 - 4$

49. $y = 3x^2 + 6x - 1$

$y = 2(x+1)^2 + 1$ $\quad y = 3(x+1)^2 - 4$

$y = 2(x+1)^2 - 1$ $\quad y = 3(x-1)^2 - 4$

Mixed Exercises

Solve each quadratic inequality by using a graph, a table, or algebraically.

21. $-2x^2 + 12x < -15$

22. $5x^2 + x + 3 \geq 0$

Mixed Exercises

Solve each quadratic inequality by using a graph, a table, or algebraically.

23. $11 \leq 4x^2 + 7x$

24. $x^2 - 4x \leq -7$

Mixed Exercises

Solve each quadratic inequality by using a graph, a table, or algebraically.

25. $-3x^2 + 10x < 5$

Solve the related equation.

$-3x^2 + 10x = 5$ Related equation

$-3x^2 + 10x - 5 = 0$ Subtract 5 from each side.

$x \approx 0.61$ or $x \approx 2.72$ Quadratic Formula

Plot the solutions on a number line and test a value from each interval.

Test $x = 0$, $x = 1$, and $x = 3$.

The values that satisfies the original inequality are $x = 0$ and $x = 3$, so the solution set is $\{x \mid x < 0.61 \text{ or } x > 2.72\}$.

26. $-1 \geq -x^2 - 5x$

Solve the related equation.

$-1 = -x^2 - 5x$ Related equation

$0 = -x^2 - 5x + 1$ Add 1 to each side.

$-5.19 \approx x$ or $0.19 \approx x$ Quadratic Formula

Plot the solutions on a number line and test a value from each interval.

Test $x = -6$, $x = 0$, and $x = 1$.

The values that satisfies the original inequality are $x = -6$ and $x = 1$, so the solution set is $\{x \mid x \leq -5.19 \text{ or } x \geq 0.19\}$.

Mixed Exercises

Solve each quadratic inequality by using a graph, a table, or algebraically.

27. $x^2 + 2x + 1 > 0$

28. $x^2 - 3x + 2 \leq 0$

Mixed Exercises

Solve each quadratic inequality by using a graph, a table, or algebraically.

29. $-x^2 - 4x + 32 \geq 0$