



12 GENERAL



هيكل الرياضيات

الفصل الأول 2025-2026

EOT-12 GEN -TERM1

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Ex1 Graph $f(x) = x^2 + 2x - 3$. State the domain and range.

- a) Domain: $(-4, \infty)$, Range: $(-\infty, \infty)$**
- b) Domain: $(-\infty, \infty)$, Range: $[-4, \infty)$**
- c) Domain: $[0, \infty)$, Range: $[-4, \infty)$**
- d) Domain: $(-\infty, \infty)$, Range: $(-\infty, \infty)$**

1) Graph $f(x) = x^2 + 6x + 8$. State the domain and range.

- a) Domain: $(-3, \infty)$, Range: $[-1, \infty)$**
- b) Domain: $(-\infty, \infty)$, Range: $[-1, \infty)$**
- c) Domain: $(-\infty, \infty)$, Range: $(-\infty, -1]$**
- d) Domain: $[-1, \infty)$, Range: $(-\infty, \infty)$**

2) Graph $f(x) = -x^2 - 2x + 2$. State the domain and range.

a) Domain: $(-\infty, \infty)$, Range: $(-\infty, 3]$

b) Domain: $(-\infty, 3]$, Range: $(-\infty, \infty)$

c) Domain: $(-\infty, \infty)$, Range: $[3, \infty)$

d) Domain: $[1, \infty)$, Range: $(-\infty, 3]$

3) Graph $f(x) = 2x^2 - 4x + 3$. State the domain and range.

a) Domain: $(-\infty, \infty)$, Range: $[1, \infty)$

b) Domain: $[1, \infty)$, Range: $(-\infty, \infty)$

c) Domain: $(-\infty, \infty)$, Range: $(-\infty, 1]$

d) Domain: $(-\infty, 1]$, Range: $(-\infty, \infty)$

4) Graph $f(x) = -2x^2$. State the domain and range.

Choices:

a) Domain: $(-\infty, \infty)$, Range: $[0, \infty)$

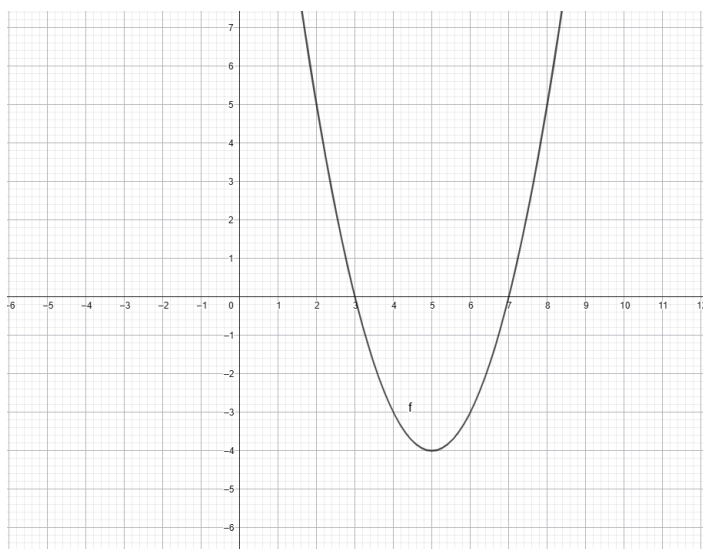
b) Domain: $(-\infty, 0]$, Range: $(-\infty, \infty)$

c) Domain: $(-\infty, \infty)$, Range: $(-\infty, 0]$

d) Domain: $[0, \infty)$, Range: $(-\infty, 0]$

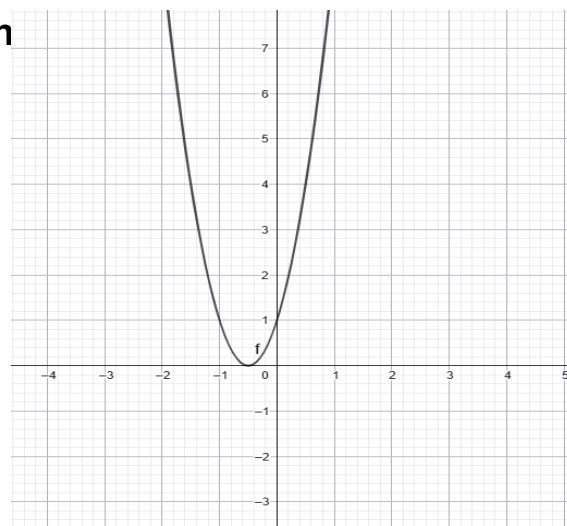
Question 4: Solve $x^2 - 10x + 21 = 0$ by graphing.

- a) $x = -3, -7$
- b) $x = 3, 7$
- c) $x = -3, 7$
- d) $x = 3, -7$



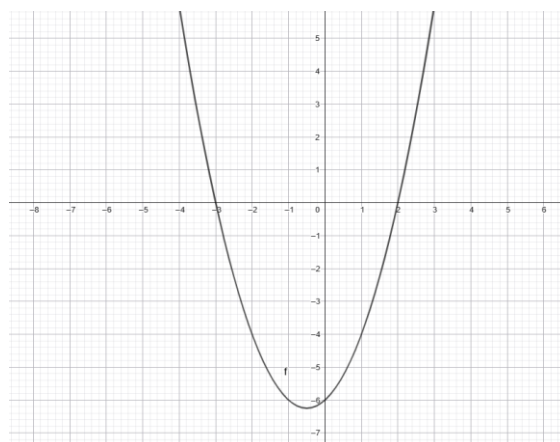
Question 5: Solve $4x^2 + 4x + 1 = 0$ by graphing

- a) $x = 1$
- b) $x = -1$
- c) $x = -\frac{1}{2}$
- d) No real solution



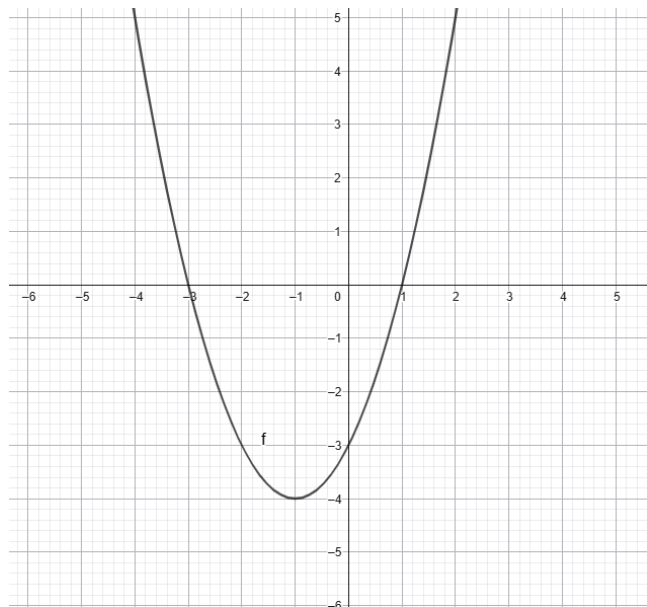
Question 6: Solve $x^2 + x - 6 = 0$ by graphing.

- a) $x = -3, 2$
- b) $x = 3, -2$
- c) $x = -3, -2$
- d) $x = 3, 2$



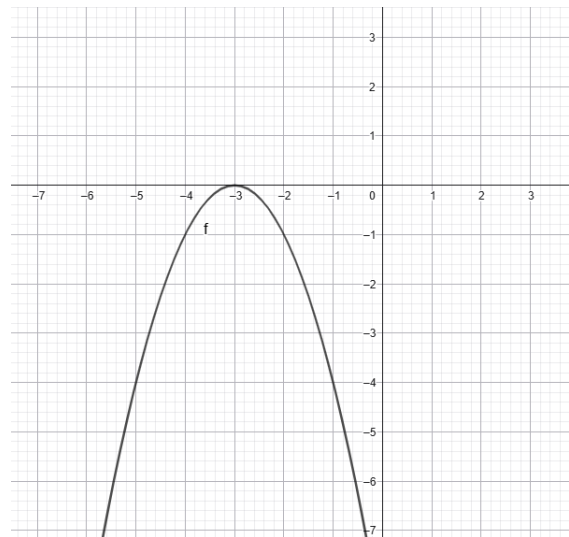
Question 7: Solve $x^2 + 2x - 3 = 0$ by graphing.

- a) $x = -3, 1$
- b) $x = 3, -1$
- c) $x = -3, -1$
- d) $x = 3, 1$



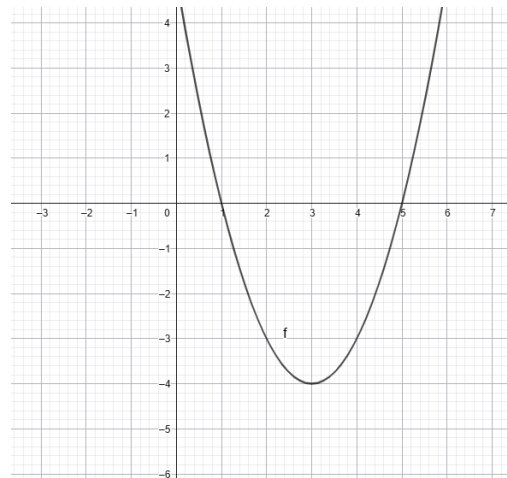
Question 8: Solve $-x^2 - 6x - 9 = 0$ by graphing.

- a) $x = 3$
- b) $x = -3$
- c) $x = 6$
- d) No real solution



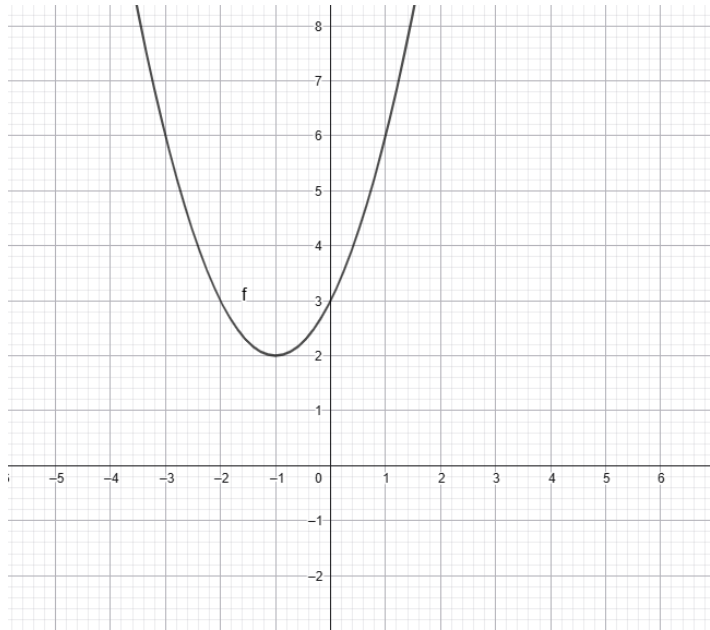
Question 9: Solve $x^2 - 6x + 5 = 0$ by graphing.

- a) $x = -5, -1$
- b) $x = 5, 1$
- c) $x = -5, 1$
- d) $x = 5, -1$



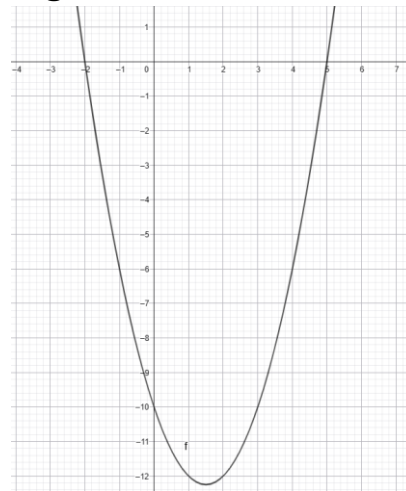
Question 10: Solve $x^2 + 2x + 3 = 0$ by graphing.

- a) $x = -1, 3$
- b) $x = 1, -3$
- c) $x = -1 \pm i\sqrt{2}$
- d) No real solution



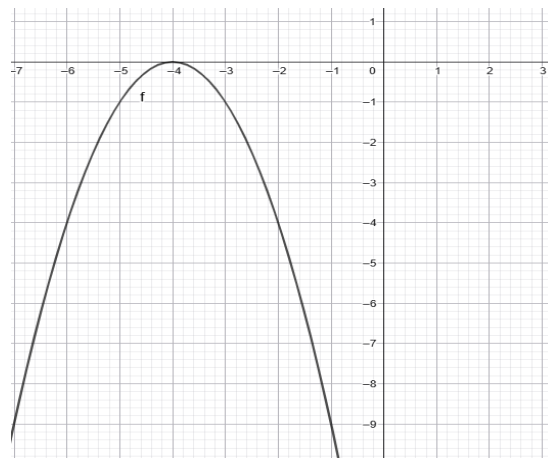
Question 11: Solve $x^2 - 3x - 10 = 0$ by graphing.

- a) $x = -2, 5$
- b) $x = 2, -5$
- c) $x = -2, -5$
- d) $x = 2, 5$



Question 12: Solve $-x^2 - 8x - 16 = 0$ by graphing.

- a) $x = 4$
- b) $x = -4$
- c) $x = 8$
- d) No real solution



3	Solve Quadratic Equations by Factoring	Ex1&2&4	27&28&29
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Ex1 : Solve $12x^2 - 2x = x$ by factoring.

- a) $x = 0, \frac{1}{4}$
- b) $x = 0, \frac{1}{3}$
- c) $x = 0, -\frac{1}{4}$
- d) $x = 0, -\frac{1}{3}$

Ex2 : Solve $x^2 - 6x - 9 = 18$ by factoring.

- a) $x = 3, -9$
- b) $x = -3, 9$
- c) $x = 3, 9$
- d) $x = -3, -9$

Solve $3x^2 + 5x + 15 = 17$ by factoring.

- a) $x = 2, \frac{1}{3}$
- b) $x = -2, -\frac{1}{3}$
- c) $x = -2, \frac{1}{3}$
- d) $x = 2, -\frac{1}{3}$

4	Complete the square in quadratic expressions to solve quadratic equations	Ex4	35
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Find the value of c that makes $x^2 - 7x + c$ a perfect square. Then write the trinomial as a perfect square.

a) $c = 14, (x - 7)^2$

b) $c = \frac{49}{4}, (x - \frac{7}{2})^2$

c) $c = 49, (x - 7)^2$

d) $c = \frac{7}{2}, (x - \frac{7}{2})^2$

Find the value of c that makes $x^2 + 5x + c$ a perfect square. Then write the trinomial as a perfect square.

a) $c = 10, (x + 5)^2$

b) $c = \frac{5}{2}, (x + \frac{5}{2})^2$

c) $c = 25, (x + 5)^2$

d) $c = \frac{25}{4}, (x + \frac{5}{2})^2$

Find the value of c that makes $x^2 + 8x + c$ a perfect square. Then write the trinomial as a perfect square.

a) $c = 16, (x + 4)^2$

b) $c = 8, (x + 4)^2$

c) $c = 64, (x + 8)^2$

d) $c = 32, (x + 4)^2$

5	Complete the square in quadratic expressions to solve quadratic equations.	Ex5	35
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Solve $x^2 + 18x - 4 = 0$ by completing the square.

- a) $x = -9 \pm \sqrt{85}$
- b) $x = 9 \pm \sqrt{85}$
- c) $x = -9 \pm \sqrt{77}$
- d) $x = 9 \pm \sqrt{77}$

Question 2:

Solve $x^2 - 10x + 7 = 0$ by completing the square.

- a) $x = 5 \pm 4\sqrt{2}$
- b) $x = -5 \pm \sqrt{18}$
- c) $x = 5 \pm 3\sqrt{2}$
- d) $x = -5 \pm 4\sqrt{2}$

Solve $x^2 + 6x - 7 = 0$ by completing the square.

Choices:

- a) $x = -3 \pm \sqrt{16}$
- b) $x = 3 \pm \sqrt{2}$
- c) $x = -1, 7$
- d) $x = 1, -7$

6	Determine the number and type of roots of a quadratic equation	Key Concept Discriminant	45
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1) Find the value of the discriminant and Describe the number and type of roots

$$2x^2 - 10x + 7 = 0$$

- a) Discriminant = 44; Two real rational roots
- b) Discriminant = 44; Two complex roots
- c) Discriminant = 44; Two real irrational roots
- d) Discriminant = 100; Two real rational roots

2) Find the value of the discriminant and Describe the number and type of roots

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

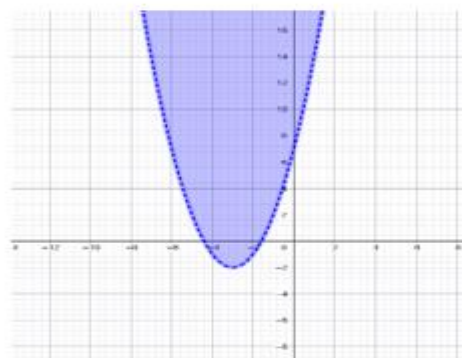
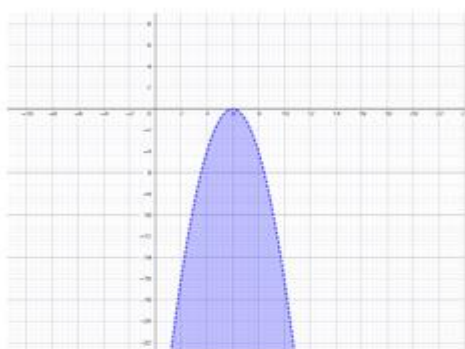
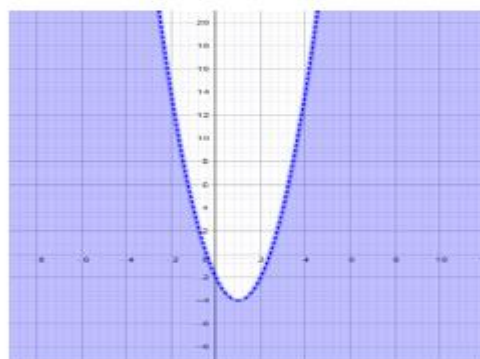
- a) Discriminant = 0; One real rational root
- b) Discriminant = 64; Two real rational roots
- c) Discriminant = -64; Two complex roots
- d) Discriminant = 0; One real irrational root

3) Find the value of the discriminant and Describe the number and type of roots

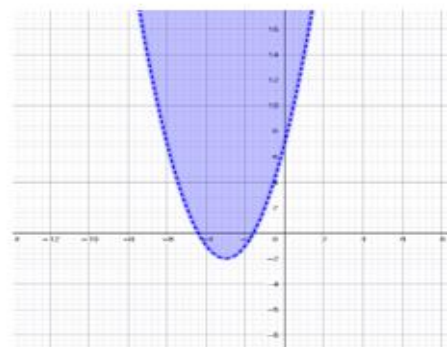
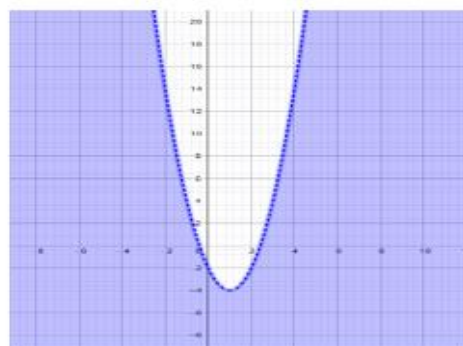
$$-5x^2 + 10x - 15 = 0$$

- a) Discriminant = -200; Two complex roots
- b) Discriminant = 400; Two real rational roots
- c) Discriminant = -200; One real rational root
- d) Discriminant = 100; Two real irrational roots

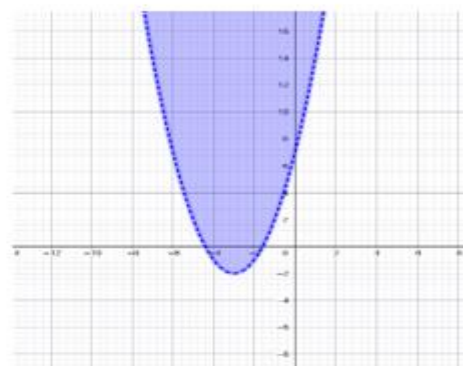
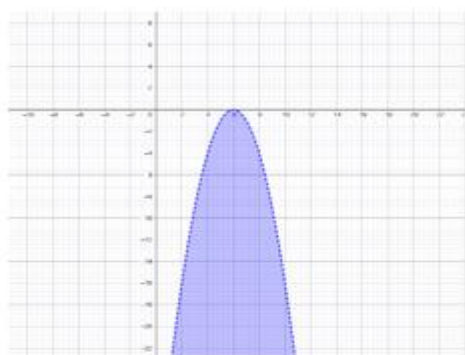
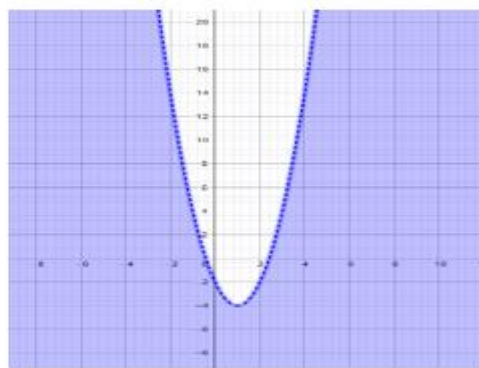
Question 4: Graph the inequality $y \leq x^2 + 4$.



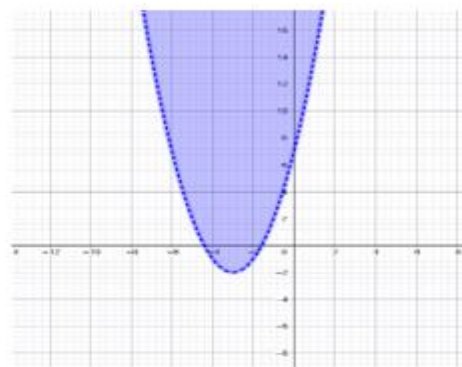
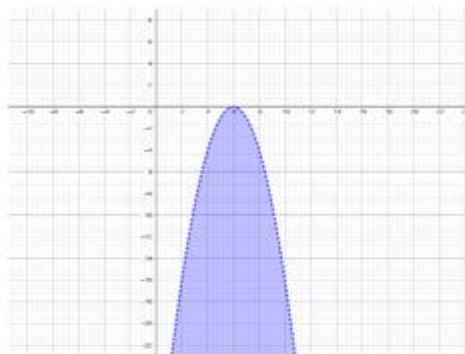
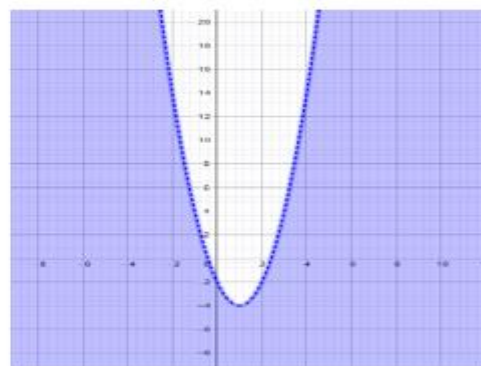
Question 5: Graph the inequality $y < 2x^2 - 4x - 2$.



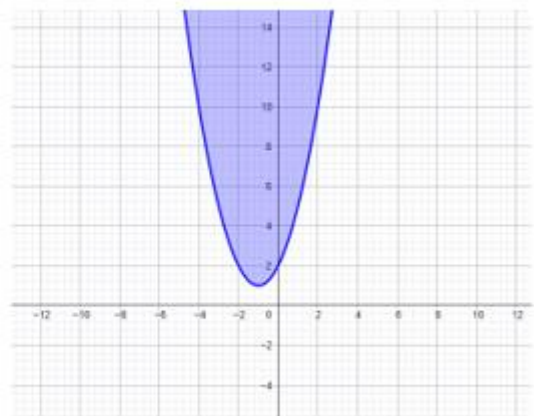
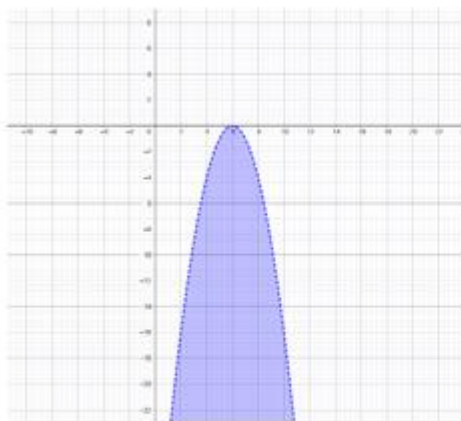
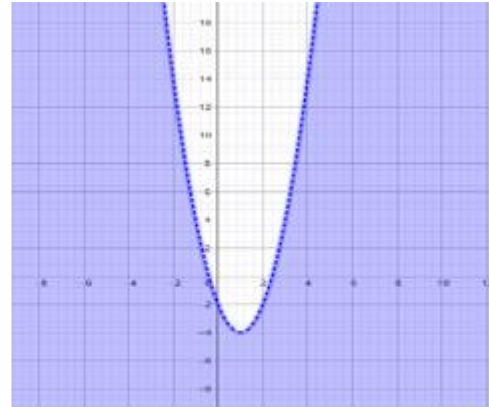
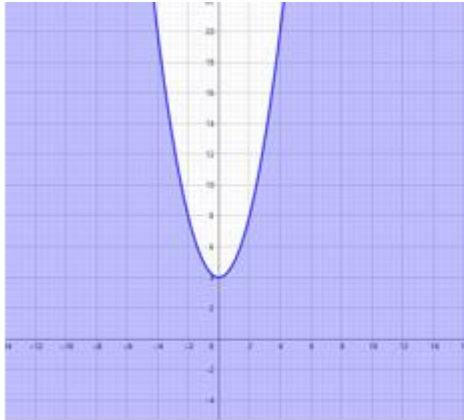
Question 6: Graph the inequality $-x^2 + 12x - 36 > y$.



Question 7: Graph the inequality $y > x^2 + 6x + 7$.



Question 9: Graph the inequality $y \geq x^2 + 2x + 2$.



8	Graph and analyze polynomial functions	Ex3	75
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Question 1:

State the degree and leading coefficient of $2x^4 - 3x^3 - 4x^2 - 5x + 6$.

- a) degree: 3, leading coefficient: 2
- b) degree: 4, leading coefficient: 2
- c) degree: 4, leading coefficient: -3
- d) This is not a polynomial in one variable.

Question 2: State the degree and leading coefficient of $7x^3 - 2$.

- a) degree: 3, leading coefficient: 7
- b) degree: 7, leading coefficient: 3
- c) degree: 3, leading coefficient: -2
- d) This is not a polynomial in one variable.

Question 3: State the degree and leading coefficient of $4x^2 - 2xy + 8y^2$.

- a) degree: 2, leading coefficient: 4
- b) degree: 2, leading coefficient: -2
- c) This is not a polynomial in one variable. There are two variables, x and y .
- d) This is not a polynomial in one variable. The term $-2xy$ has variables multiplied together.

Question 4: State the degree and leading coefficient of

$$x^5 + 12x^4 - 3x^3 + 2x^2 + 8x + 4.$$

- a) degree: 5, leading coefficient: 1
- b) degree: 12, leading coefficient: 1
- c) degree: 5, leading coefficient: 12
- d) This is not a polynomial in one variable.

Question 5:

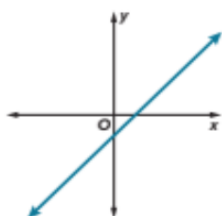
State the degree and leading coefficient of $11x^3 + 5x^2 - 7x - \frac{6}{x}$.

- a) degree: 3, leading coefficient: 11
- b) degree: 11, leading coefficient: 3
- c) This is not a polynomial in one variable. There are two variables, x and y .
- d) This is not a polynomial in one variable. The term $\frac{6}{x}$ has the variable with an exponent less than 0.

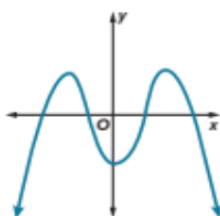
9	Graph and analyze polynomial functions	15-20	80
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State the number of real zeros of the function using the graph.

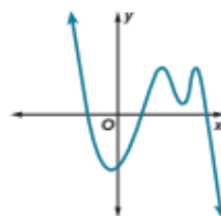
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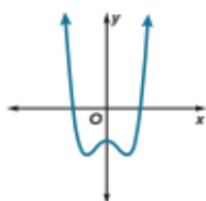
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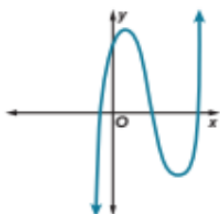
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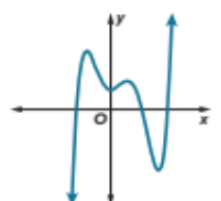
18.



19.



20.



10	Approximate zeros by graphing polynomial functions	Ex1	83
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Determine the consecutive integer values of x between which each real zero of $f(x) = x^4 - 2x^3 - x^2 + 1$ is located.

x	-2	-1	0	1	2	3	4
$f(x)$	29	3	1	-1	-3	19	113

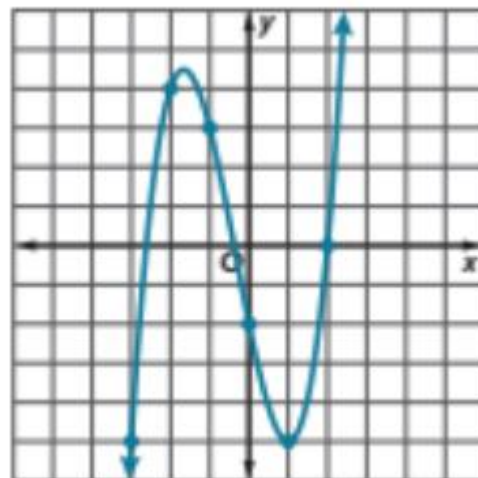
- a) Between $x = -2$ and $x = -1$
- b) Between $x = 0$ and $x = 1$ Between $x = 2$ and $x = 3$
- c) Between $x = 1$ and $x = 2$ Between $x = 0$ and $x = 1$
- d) Between $x = 2$ and $x = 3$ Between $x = 1$ and $x = 2$

Determine the consecutive integer values of x between which each real zero of $f(x) = 2x^4 + x^3 - 3x^2 - 2$ is located.

x						
$F(x)$						

- a) Between $x = -2$ and $x = -1$ $x = 1$ and $x = 2$
- b) Between $x = -1$ and $x = 0$ $= 0$ and $x = 1$
- c) Between $x = 0$ and $x = 1$
- d) Between $x = 1$ and $x = 2$ $= 0$ and $x = 1$

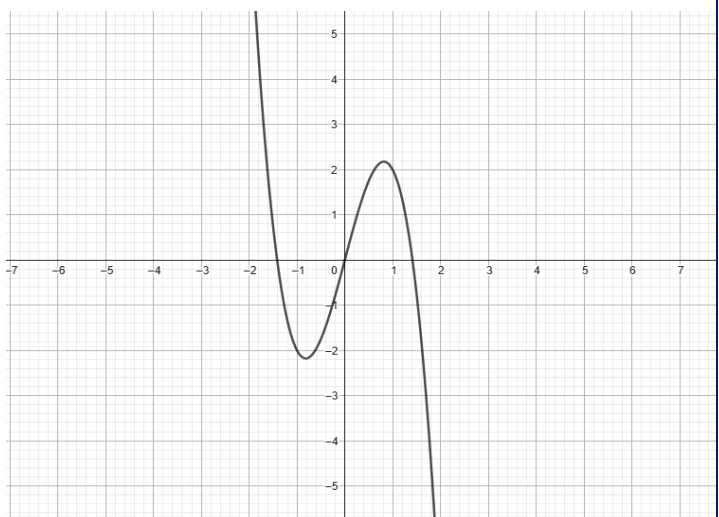
x	$f(x)$
-4	-30
-3	-5
-2	4
-1	3
0	-2
1	-5
2	0
3	19



Use the table to estimate the x -coordinates at which the relative maxima and relative minima occur for

$$f(x) = x^3 + x^2 - 5x - 2$$

- a) Relative maximum at $x = -2$, Relative minimum at $x = 1$
- b) Relative maximum at $x = -1$, Relative minimum at $x = 2$
- c) Relative maximum at $x = 0$, Relative minimum at $x = 3$
- d) Relative maximum at $x = 1$, Relative minimum at $x = -2$



- a) Relative maximum at $x = 2$, Relative minimum at $x = -2$
- b) Relative maximum at $x = 2$, Relative minimum at $x = -1$
- c) Relative maximum at $x = -1$, Relative minimum at $x = 1$
- d) Relative maximum at $x = 1$, Relative minimum at $x = -$

12	Add and subtract polynomials.	Ex2&3	94
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Question 1: Find $(6x^3 + 7x^2 - 2x + 5) + (x^3 - 4x^2 - 8x + 1)$.

- a) $5x^3 + 3x^2 - 6x + 4$
- b) $7x^3 + 3x^2 - 10x + 6$
- c) $7x^3 + 11x^2 - 10x + 6$
- d) $7x^3 + 3x^2 + 6x + 6$

Question 2: Find $(2x^3 + 9x^2 + 6x - 3) + (4x^3 - x^2 + 5x)$.

- a) $6x^3 + 8x^2 + 11x - 3$
- b) $6x^3 + 10x^2 + 11x - 3$
- c) $2x^3 + 8x^2 + 11x - 3$
- d) $6x^3 + 8x^2 + x - 3$

Question 3: Find $(2x^5 + 11x^4 + 7x - 8) - (5x^4 + 9x^3 - 3x + 4)$.

- a) $2x^5 + 6x^4 - 9x^3 + 10x - 12$
- b) $2x^5 + 6x^4 - 9x^3 + 4x - 12$
- c) $2x^5 + 16x^4 - 9x^3 + 4x - 4$
- d) $2x^5 + 6x^4 + 9x^3 + 4x - 12$

Question 4: Find $(8x^2 - 3x + 1) - (5x^3 + 2x^2 - 6x - 9)$.

- a) $-5x^3 + 6x^2 - 9x + 10$
- b) $5x^3 + 6x^2 + 3x + 10$
- c) $-5x^3 + 6x^2 + 3x + 10$
- d) $-5x^3 + 10x^2 - 9x - 8$

13	Multiply polynomials	16-26	97
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Question 16: Simplify: $x^2(2x + 9)$

- a) $2x^2 + 9x^2$
- b) $2x^3 + 9x^2$
- c) $2x^2 + 9x$
- d) $2x^3 + 9$

Question 17: Simplify: $(a - 5)^2$

- a) $a^2 + 25$
- b) $a^2 - 25$
- c) $a^2 - 10a + 25$
- d) $a^2 + 10a + 25$

Question 18: Simplify: $(2x - 3)(3x - 5)$

- a) $6x^2 - x + 15$
- b) $6x^2 - 19x + 15$
- c) $6x^2 + 19x + 15$
- d) $6x^2 - 19x - 15$

Question 19: Simplify: $(x - y)(x^2 + xy + y^2)$

- a) $x^3 + y^3$
- b) $x^3 + 3x^2y + 3xy^2 + y^3$
- c) $x^3 - x^2y + xy^2 - y^3$
- d) $x^3 - y^3$

Question 20: Simplify: $(a + b)(a^3 - 3ab - b^2)$

- a) $a^4 - 2a^3b - 3a^2b - b^3$
- b) $a^4 + a^3b - 3a^2b - 4ab^2 - b^3$
- c) $a^4 + a^3b - 3a^2b - 3ab^2 - b^3$
- d) $a^4 - 3a^2b - ab^2 + a^3b - 3ab^2 - b^3$

Question 21: Simplify: $(x - y)(x + y)(2x + y)$

a) $2x^3 - x^2y - 2xy^2 + y^3$

b) $2x^3 + x^2y - 2xy^2 - y^3$

c) $2x^3 - x^2y - 2xy^2 - y^3$

d) $2x^3 + x^2y + 2xy^2 + y^3$

Question 22: Simplify: $(a + b)(2a + 3b)(2x - y)$

a) $(2a^2 + 3b^2)(2x - y)$

b) $(2a^2 - 5ab + 3b^2)(2x - y)$

c) $(2a^2 + 5ab - 3b^2)(2x - y)$

d) $(2a^2 + 5ab + 3b^2)(2x - y)$

Question 23: Simplify: $(r - 2t)(r + 2t)$

Choices:

a) $r^2 + 4t^2$

b) $r^2 - 4t^2$

c) $r^2 + 2t^2$

d) $r^2 - 2t^2$

Question 24: Simplify: $(3y + 4)(2y - 3)$

Choices:

a) $6y^2 + y - 12$

b) $6y^2 - 17y - 12$

c) $6y^2 - y - 12$

d) $6y^2 + 17y - 12$

Question 25:

Simplify: $(x^3 - 3x^2 + 1)(2x^2 - x + 2)$

- a) $2x^5 + 7x^4 + 8x^3 - 7x^2 - x + 2$
- b) $2x^5 - 7x^4 + 8x^3 - 7x^2 - x + 2$
- c) $2x^5 - 7x^4 - 8x^3 - 7x^2 - x + 2$
- d) $2x^5 - 7x^4 + 5x^3 - 4x^2 - x + 2$

Question 26: Simplify: $(4x^5 + x^3 - 7x^2 + 2)(3x - 1)$

- a) $12x^6 - 4x^5 + 3x^4 - 8x^3 - 21x^2 + 13x - 2$
- b) $12x^6 - 4x^5 + 3x^4 - x^3 - 21x^2 + 13x - 2$
- c) $12x^6 - 4x^5 + 3x^4 - 22x^3 + 7x^2 + 6x - 2$
- d) $12x^6 + 4x^5 + 3x^4 - 8x^3 - 21x^2 + 13x - 2$

Question 1:**Find $(24a^3b^2 + 18a^2b^2 - 30ab^3) \div (6ab)$.**

a) $4a^2b - 3ab - 5b^2$

b) $4a^2b + 3ab + 5b^2$

c) $4a^2b + 3a - 5b^2$

d) $4a^2b + 3ab - 5b^2$

Question 2: Find $(x^2 - 5x - 36) \div (x + 4)$.

a) $x + 9$

b) $x - 9$

c) $x + 6$

d) $x - 6$

Question 3:**Find $\frac{3z^3 - 14z^2 - 7z + 3}{z - 5}$.****Choices:**

a) $3z^2 + z - 2 + \frac{-7}{z-5}$

b) $3z^2 - z - 2 + \frac{7}{z-5}$

c) $3z^2 + z + 2 + \frac{7}{z-5}$

d) $3z^2 - z + 2 + \frac{-7}{z-5}$

Ex6 P125

Write each expressions in quadratic form.

a. $4x^{20} + 6x^{10} + 15$

b. $18x^4 + 180x^2 - 28$

c. $9x^6 - 4x^2 - 12$

Write each expressions in quadratic form.

16. $x^4 + 12x^2 - 8$

A) $(x^4)^2 + 12x^2 - 8$

B) $(x^2)^2 + 12(x^2) - 8$

C) $(x^2)^2 - 12x^2 + 8$

D) $(x^4) + 12x - 8$

17. $-15x^4 + 18x^2 - 4$

A) $-15x^2 + 18x - 4$

B) $-15(x^4)^2 + 18x^2 - 4$

C) $-15(x^2)^2 + 18(x^2) - 4$

D) $15(x^2)^2 - 18(x^2) + 4$

18. $8x^6 + 6x^3 + 7$

A) $8x^2 + 6x + 7$

B) $8(x^6)^2 + 6x^3 + 7$

C) $(8x^3)^2 + 6x^3 + 7$

D) $8(x^3)^2 + 6(x^3) + 7$

19. $5x^6 - 2x^3 + 8$

A) $5(x^2)^3 - 2x^2 + 8$

B) $5(x^3)^2 - 2(x^2) + 8$

C) $5(x^3)^2 - 2x^3 + 8$

D) $5x^3 - 2x^2 + 8$

20. $9x^8 - 21x^4 + 12$

A) $9(x^2)^4 - 21x^4 + 12$

B) $9x^4 - 21x^2 + 12$

C) $9(x^4)^2 - 21x^4 + 12$

D) $9(x^8)^2 - 21x^4 + 12$

21. $16x^{10} + 2x^5 + 6$

A) $16(x^{10})^2 + 2x^5 + 6$

B) $16x^5 + 2x^2 + 6$

C) $(16x^5)^2 + 2x^5 + 6$

D) $16(x^5)^2 + 2(x^5) + 6$

solve each equation by factoring.

22. $x^4 + 6x^2 + 5 = 0$

A) $x = \pm 1, \pm\sqrt{5}$

B) $x = \pm i, \pm i\sqrt{5}$

C) $x = \pm 2, \pm 3$

D) $x = \pm 2i, \pm 3i$

23. $x^4 - 3x^2 - 10 = 0$

A) $x = \pm\sqrt{5}, \pm i\sqrt{2}$

B) $x = \pm 2, \pm 3$

C) $x = \pm i, \pm 2i$

D) $x = \pm 1, \pm\sqrt{10}$

24. $x^4 - 3x^2 - 10 = 0$

A) $x = \pm 2, \pm 3$

B) $x = \pm\sqrt{5}, \pm i\sqrt{2}$

C) $x = \pm i, \pm 2i$

D) $x = \pm 1, \pm\sqrt{10}$

25. $9x^4 - 27x^2 + 20 = 0$

A) $x = \pm 1, \pm 2$

B) $x = \pm \frac{2}{\sqrt{3}}, \pm \sqrt{\frac{5}{3}}$

C) $x = \pm i, \pm 2i$

D) $x = \pm\sqrt{2}, \pm\sqrt{3}$

26. $4x^4 - 5x^2 - 6 = 0$

A) $x = \pm\sqrt{2}, \pm\frac{i\sqrt{3}}{2}$

B) $x = \pm 1, \pm 2$

C) $x = \pm i, \pm 2i$

D) $x = \pm\sqrt{3}, \pm\sqrt{5}$

27. $24x^4 + 14x^2 - 3 = 0$

A) $x = \pm 1, \pm 2$

B) $x = \pm i, \pm 2i$

C) $x = \pm\frac{1}{\sqrt{6}}, \pm\frac{i\sqrt{3}}{2}$

D) $x = \pm\sqrt{2}, \pm\sqrt{3}$

Q16	Graph exponential growth functions.	Ex1&2	217&218
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Ex1. Gragh $f(x) = 2^x$. Find the domain, range, y – intercept, asymptote, and end of behavior.

x	$F(x)$

domain =

range =

y – intercept =

asymptote =

end of behavior =

Ex2. Gragh $g(x) = -\frac{1}{2}3^x + 1$ describe the transformatins

x	$F(x)$

domain =

range =

y – intercept =

asymptote =

end of behavior =

Q17	Graph exponential decay functions	Ex6&7	219&220
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Ex6. Gragh $f(x) = \left(\frac{1}{2}\right)^x$, and find .

domain =

range =

y – intercept =

asymptote =

end of behavior =

Ex7. Gragh $f(x) = -2\left(\frac{1}{4}\right)^{x-4} + 3$, and find .

domain =

range =

y – intercept =

asymptote =

end of behavior =

Q18	Distinguish among sample surveys, experiments, and observational studies	Ex4&11-14	373 &376
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A survey

collects data from a group's responses about their characteristics, behaviors, or opinions.

An experiment

divides a sample into two randomly assigned groups: an experimental group and a control group. The effect on the experimental group is then compared to the control group.

An observational study

measures or observes members of a sample without affecting them.

Determine whether each situation describes a survey, an experiment, or an observational study.

Ex 4 . A research team aims to test new football uniform designs and their appeal to young adults. They randomly select 100 young adults to view the various uniforms. The team then observes and records the reactions to the designs.

a) survey b) an experiment c) observational study d) census

11. An Internet service provider conducts an online study in which customers are randomly selected and asked to provide feedback on their customer service.

a) survey b) an experiment c) observational study d) census

12. A research group randomly selects 100 business owners, half of whom started their own businesses, and compares their success.

a) survey b) an experiment c) observational study d) census

13. A research group randomly chooses 50 people to participate in a study to determine whether exercising regularly reduces the risk of diabetes in adults.

a) survey b) an experiment c) observational study d) census

14. An online video streaming service mails a questionnaire to randomly selected people across the country to determine whether they prefer streaming movies or sports.

a) survey b) an experiment c) observational study d) census

Ex3 . A restaurant owner wants to decide whether to add vegetarian options or more traditional meat-based dishes to her menu. She conducts a survey asking her customers: "Do you prefer a plain salad or a delicious steak?" This question is biased because it uses positive language for the steak ("delicious") and neutral or bland language for the salad ("plain"), which may influence customers' responses.

Identify each sample as biased or unbiased.

4. A random sample of eight people is asked to select their favorite food for a survey about Americans' food preferences.

a) biased

b) unbiased

5. Every tenth student at band camp is asked to name his or her favorite band for a survey about the campers.

a) biased

b) unbiased

6. Every fifth person entering a museum is asked to name his or her favorite type of book to read for a survey about the reading interests of people in the city.

a) biased

b) unbiased

7. Do you think that the workout facility needs a new treadmill and racquetball court?

a) biased

b) unbiased

8. Which is your favourite type of music, pop, or country?

a) biased

b) unbiased

8. Which type of music do you prefer: pop or country?

a) biased

b) unbiased

9. Do you participate in any after-school clubs?

a) biased

b) unbiased

10. Do you agree that employees should pack their lunch?

a) biased

b) unbiased

23. To determine whether the school should purchase new computer software, the technology team divides a group of 50 students into two groups by age. Half of the students from each age group are randomly selected to complete an activity using the current computer software, and the other half of the students from each group complete the same activity using the new computer software. The students' actions are recorded and analyzed.

a) Systematic b) Self-selected c) Convenience d) Stratified

21) To determine the music preferences of their customers, a music store manager selects 10 customers in the store to interview.

a) Systematic b) Self-selected c) Convenience d) Stratified

22. To find out what types of materials patrons use most, administrators at a community library record the type of media each patron uses every Friday.

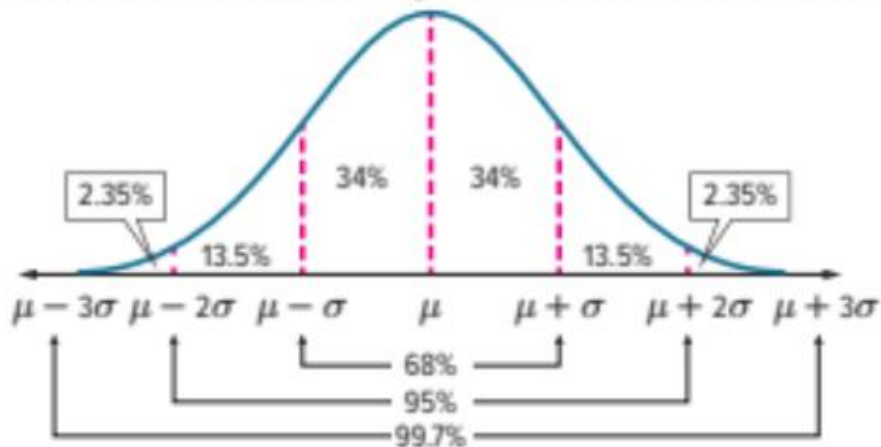
a) Systematic b) Self-selected c) Convenience d) Stratified

23. To decide whether to purchase new computer software, a technology team divides 50 students into two age groups. Half of the students from each age group are randomly assigned to complete an activity using the current software, and the other half use the new software. The students' actions are recorded and analyzed.

a) Systematic b) Self-selected c) Convenience d) Stratified

Key Concept • The Empirical Rule

In a normal distribution with mean μ and standard deviation σ ,



- approximately 68% of the data fall within 1σ of the mean,
- approximately 95% of the data fall within 2σ of the mean, and
- approximately 99.7% of the data fall within 3σ of the mean.

Example 5: Use the Empirical Rule to Analyze Data

A normal distribution has a mean of 42 and a standard deviation of 6.

a. Find the range of values that represents the middle 95% of the distribution.

- A) 24 to 60
- B) 36 to 48
- C) 30 to 54
- D) 32 to 52

b. What percent of the data will be greater than 36

- A) 16%
- B) 84%
- C) 68%
- D) 34%

A normal distribution has a mean of 186.4 and a standard deviation of 48.9.

a. What range of values represents the middle 99.7% of the data?

- A) 137.5 to 235.3
- B) 88.6 to 284.2
- C) 39.7 to 333.1
- D) 186.4 to 235.3

b. What percent of data will be greater than 235.3?

- A) 16%
- B) 32%
- C) 68%
- D) 84%

c. What range of values represents the upper 2.5% of the data?

- A) greater than 235.3
- B) greater than 284.2
- C) greater than 333.1
- D) greater than 186.4

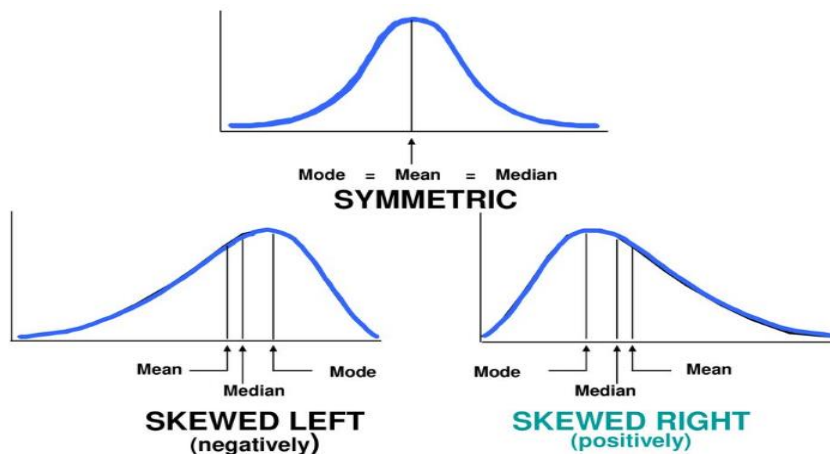
$$z = \frac{x - \mu}{\sigma}$$

Find z if $x = 24$, $\mu = 19$ and $\sigma = 3.8$

- A) 1.05**
- B) 1.32**
- C) 1.68**
- D) 1.92**

Find z if $x = 106.3$, $\mu = 88.8$ and $\sigma = 9.6$

- A) 1.82
- B) 1.95
- C) 2.12
- D) 2.35



Use the table to find the area under the normal curve for each interval

11) $z > 0.58$

- 0.7190 (A)
- B) 0.2810
- C) 0.5000
- D) 0.4200

12) $z < -1.56$

- A) 0.0594
- B) 0.9406
- C) 0.4394
- D) 0.5606

13) $-2.29 < z < 2.76$

- A) 0.9772
- B) 0.0111
- C) 0.9971
- D) 0.9861

21	Solve quadratic equations by using the Quadratic Formula	1-6,12,13	47
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Question 1:

Solve $x^2 + 8x + 15 = 0$ using the Quadratic Formula.

$$x = -3, -5$$

Question 2:

Solve $x^2 - 18x + 72 = 0$ using the Quadratic Formula.

$$x = 12, 6$$

Question 3: Solve $12x^2 - 22x + 6 = 0$ using the Quadratic Formula.

$$x = \frac{1}{3}, \frac{3}{2}$$

Question 4: Solve $4x^2 - 6x = -2$ using the Quadratic Formula.

$$a) x = 1, \frac{1}{2}$$

Question 5: Solve $x^2 + 8x + 5 = 0$ using the Quadratic Formula.

$$x = -4 \pm \sqrt{11}$$

Question 6: Solve $-8x^2 + 4x = -5$ using the Quadratic Formula.

$$x = \frac{1 \pm \sqrt{11}}{4}$$

22	Divide polynomials by using synthetic division	Ex 4 & 5	103&104
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Question 1:

Find $(3x^3 - 2x^2 - 53x - 60) \div (x + 3)$ using synthetic division.

Question 2:

Find $\frac{4x^4 - 37x^2 + 4x + 9}{2x - 1}$ using synthetic division.

Factor Completely. If the polynomial is not factor, write prime.

1. $8c^3 - 27b^3$

2. $64x^4 + xy^4$

3. $a^8 - a^2b^6$

4. $x^6y^3 + y^9$

5. $18x^6 + 5y^6$

6. $w^3 - 2y^3$

$$8. 12ax^2 - 20cy^2 - 18bx^2 - 10ay^2 + 24cx^2$$

$$9. a^3x^2 - 16a^3x + 64a^3 - b^3x^2 + 16b^3x - 64b^3$$

$$10. 8x^5 - 25y^3 + 80x^4 - x^2y^2 + 200x^3 - 10xy^3$$

Q24	Solve exponential equations in one variable	1-6	229
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1) *solve* $25^{2x+3} = 25^{5x-9}$

2) *solve* $9^{8x-4} = 81^{3x+6}$

3) *solve* $4^{x-5} = 16^{2x-31}$

4) *solve* $4^{3x-3} = 8^{4x-4}$

5) *solve* $9^{-x+5} = 27^{6x-10}$

6) *solve* $125^{3x-4} = 25^{4x+2}$

Q25	(a,b) Analyze standardized data and distributions by using z-values	Ex8&14	400&402
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Ex8. The number of daily visits to a local news website follows a normal distribution with a mean (μ) of 98,452 visits and a standard deviation (σ) of 10,325 visits. Determine the probability that the website receives at least 100,000 visits on a given day, $P(X \geq 100,000)$.

Q14. TESTING The scores on a test given to job applicants are normally distributed with a mean of 100 and a standard deviation of 12.3.

a. About what percent of the scores fall between 70 and 80?

b. About what percent of the scores are above 115?

c. If 75 people take the test, approximately how many would be expected to score below 75?

