

Exercises - Polynomial Functions and Their Graphs

1

The graph of $f(x) = ax^3 + x^2 - 18x - 9$ intersects the x -axis at $(3, 0)$. What is the value of a ?

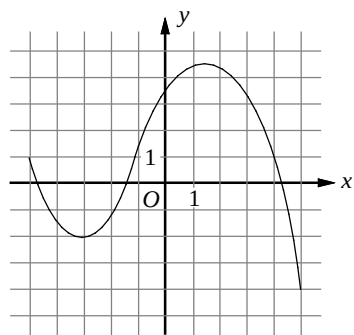
- A) -1
- B) 0
- C) 1
- D) 2

2

In the xy -plane, the graph of function f has x -intercepts at -7 , -5 , and 5 . Which of the following could define f ?

- A) $f(x) = (x-7)(x^2-25)$
- B) $f(x) = (x-7)(x^2+25)$
- C) $f(x) = (x+7)(x^2-25)$
- D) $f(x) = (x+7)(x^2+25)$

3

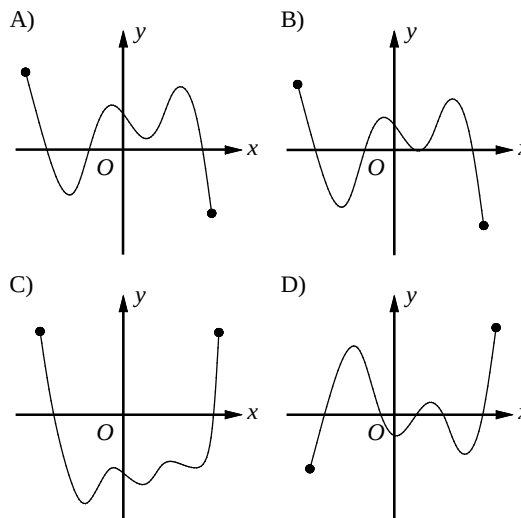


What is the minimum value of the function graphed on the xy -plane above, for $-5 \leq x \leq 5$?

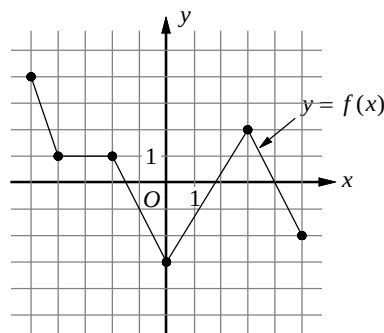
- A) -4
- B) -3
- C) -2
- D) $-\infty$

4

If function f has four distinct zeros, which of the following could represent the complete graph of f in the xy -plane?



5



The complete graph of function f is shown on the xy -plane above, for $-5 \leq x \leq 5$. Which of the following is/are true?

- I. f is strictly decreasing for $-5 < x < 0$.
- II. $f(-3) = 1$
- III. f is minimum at $x = 5$.

- A) I only
- B) II only
- C) III only
- D) I and II only

Exercises - Polynomial Functions and Their Graphs

1

If -1 and 1 are two real roots of the polynomial function $f(x) = ax^3 + bx^2 + cx + d$ and $(0, 3)$ is the y -intercept of graph of f , what is the value of b ?

- A) -3
- B) -1
- C) 2
- D) 4

2

What is the remainder of polynomial $p(x) = 81x^5 - 121x^3 - 36$ divided by $x + 1$?

- A) -76
- B) -36
- C) 4
- D) 6

3

If $x - 2$ is a factor of polynomial $p(x) = a(x^3 - 2x) + b(x^2 - 5)$, which of the following must be true?

- A) $a + b = 0$
- B) $2a - b = 0$
- C) $2a + b = 0$
- D) $4a - b = 0$

4

x	$f(x)$
-4	-10
-3	0
-1	-4
2	20

The function f is defined by a polynomial. Some values of x and $f(x)$ are shown in the table above. Which of the following must be a factor of $f(x)$?

- A) $x + 4$
- B) $x + 3$
- C) $x + 1$
- D) $x - 2$

5

$$x^3 - 8x^2 + 3x - 24 = 0$$

For what real value of x is the equation above true?

6

If $x > 0$, what is the solution to the equation $x^4 - 8x^2 = 9$?

Exercises - Radical Expressions

1

Which of the following is equal to $a^{-\frac{1}{2}}$?

- A) $-\sqrt{a}$
- B) $\frac{1}{\sqrt{a}}$
- C) $-\frac{1}{\sqrt{a}}$
- D) $\frac{1}{a^2}$

2

Which of the following is equal to $\frac{1}{3-2\sqrt{2}}$?

- A) $3-\sqrt{2}$
- B) $3+\sqrt{2}$
- C) $3+2\sqrt{2}$
- D) $3+4\sqrt{2}$

3

If $(x+1)^3 = -64$, what is the value of x ?

- A) -6
- B) -5
- C) -4
- D) -3

4

Which of the following is equal to

$$\sqrt{8} + \sqrt{18} - \sqrt{32}?$$

- A) $\sqrt{2}$
- B) $2\sqrt{2}$
- C) $3\sqrt{2}$
- D) $\sqrt{3}$

5

Which of the following is equal to

$$(1+\sqrt{3})(2-\sqrt{3})?$$

- A) $1-\sqrt{3}$
- B) $1+\sqrt{3}$
- C) $-1-\sqrt{3}$
- D) $-1+\sqrt{3}$

6

Which of the following is equal to $b^{\frac{5}{3}}$?

- A) $b \cdot \sqrt{b}$
- B) $b \cdot \sqrt[3]{b^{\frac{1}{3}}}$
- C) $b \cdot \sqrt[3]{b}$
- D) $b \cdot \sqrt[3]{b^2}$

Exercises - Solving Radical Equations

1

$$11 - \sqrt{2x + 3} = 8$$

What is the solution set of the equation above?

- A) 0
- B) 3
- C) 6
- D) 9

2

$$\sqrt{-3x + 4} = 7$$

What is the solution set of the equation above?

- A) -15
- B) -12
- C) -8
- D) -6

3

$$\sqrt{x + 18} = x - 2$$

What is the solution set of the equation above?

- A) $\{-2\}$
- B) $\{7\}$
- C) $\{-2, 7\}$
- D) $\{2, -7\}$

4

$$\sqrt{5x - 12} = 3\sqrt{2}$$

What is the solution set of the equation above?

- A) 2
- B) 4
- C) 6
- D) 8

5

If $a = \sqrt{3}$ and $\sqrt{2 - 3x} = \frac{1}{3}a$, what is the value of x ?

6

If $k = 8 - \sqrt{2}$ and $\sqrt[3]{x - k} = -2$, what is the value of x^2 ?

Exercises - Complex Numbers

1

Which of the following is equal to $\sqrt{-1} - \sqrt{-4} + \sqrt{-9}$?

- A) i
- B) $2i$
- C) $3i$
- D) $4i$

2

Which of the following is equal to $\sqrt{-2} \cdot \sqrt{-8}$?

- A) $-4i$
- B) $4i$
- C) -4
- D) 4

3

Which of the following complex numbers is equal to $\frac{3-i}{3+i}$?

- A) $\frac{9}{10} - \frac{3i}{5}$
- B) $\frac{9}{10} + \frac{3i}{5}$
- C) $\frac{3}{5} - \frac{3i}{5}$
- D) $\frac{4}{5} - \frac{3i}{5}$

4

Which of the following is equal to $\frac{1}{2}(5i-3) - \frac{1}{3}(4i+5)$?

- A) $\frac{3}{2}i - \frac{5}{2}$
- B) $\frac{7}{6}i - \frac{7}{3}$
- C) $\frac{7}{6}i - \frac{19}{6}$
- D) $\frac{5}{6}i - \frac{17}{6}$

5

If $(4+i)^2 = a+bi$, what is the value of $a+b$?

6

If the expression $\frac{3-i}{1-2i}$ is rewritten in the form $a+bi$, in which a and b are real numbers, what is the value of $a+b$?

Answer Key

Section 13-1

1. D 2. C 3. A 4. B 5. B

Section 13-2

1. A 2. C 3. D 4. B 5. 8

6. 3

Section 13-3

1. B 2. C 3. B 4. A 5. D

6. D

Section 13-4

1. B 2. A 3. B 4. C 5. $\frac{5}{9}$

6. 2

Section 13-5

1. B 2. C 3. D 4. C 5. 23

6. 2

Chapter 13 Practice Test

1. C 2. D 3. B 4. A 5. C

6. B 7. B 8. D 9. C 10. D

Answers and Explanations

Section 13-1

1. D

$$f(x) = ax^3 + x^2 - 18x - 9$$

If point $(3, 0)$ lies on the graph of f , substitute 0 for f and 3 for x .

$$0 = a(3)^3 + (3)^2 - 18(3) - 9.$$

$$0 = 27a - 54$$

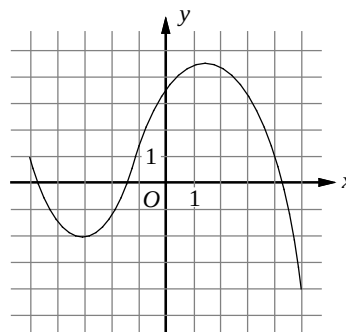
$$2 = a$$

2. C

If the graph of a polynomial function f has an x -intercept at a , then $(x - a)$ is a factor of $f(x)$. Since the graph of function f has x -intercepts at -7 , -5 , and 5 , $(x + 7)$, $(x + 5)$, and $(x - 5)$ must each be a factor of $f(x)$. Therefore,

$$f(x) = (x + 7)(x + 5)(x - 5) = (x + 7)(x^2 - 5).$$

3. A



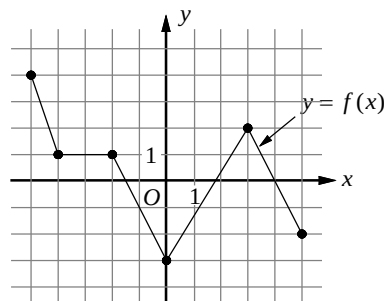
The minimum value of a graphed function is the minimum y -value of all the points on the graph. For the graph shown, when $x = -3$, $y = -2$ and when $x = 5$, $y = -4$, so the minimum is at $(5, -4)$ and the minimum value is -4 .

4. B

A zero of a function corresponds to an x -intercept of the graph of the function on the xy -plane.

Only the graph in choice B has four x -intercepts. Therefore, it has the four distinct zeros of function f .

5. B



I. f is not strictly decreasing for $-5 < x < 0$, because on the interval $-4 < x < -2$, f is not decreasing.

Roman numeral I is not true.

II. The coordinates $(-3, 1)$ is on the graph of f , therefore, $f(-3) = 1$

Roman numeral II is true.

III. For the graph shown, when $x = 0$, $y = -3$ and when $x = 5$, $y = -2$, so f is minimum at $x = 0$.

Roman numeral III is not true.

Section 13-2

1. A

If -1 and 1 are two real roots of the polynomial function, then $f(-1) = 0$ and $f(1) = 0$. Thus

$$f(-1) = a(-1)^3 + b(-1)^2 + c(-1) + d = 0 \text{ and}$$

$$f(1) = a(1)^3 + b(1)^2 + c(1) + d = 0.$$

Simplify the two equations and add them to each other.

$$-a + b - c + d = 0$$

$$+ \underline{a + b + c + d = 0}$$

$$2b + 2d = 0 \text{ or } b + d = 0.$$

Also $f(0) = 3$, since the graph of the polynomial passes through $(0, 3)$.

$$f(0) = a(0)^3 + b(0)^2 + c(0) + d = 3 \text{ implies } d = 3.$$

Substituting $d = 3$ in the equation $b + d = 0$ gives $b + 3 = 0$, or $b = -3$.

2. C

If polynomial $p(x) = 81x^5 - 121x^3 - 36$ is divided by $x + 1$, the remainder is $p(-1)$.

$$p(-1) = 81(-1)^5 - 121(-1)^3 - 36 = 4$$

The remainder is 4.

3. D

If $x - 2$ is a factor for polynomial $p(x)$, then $p(2) = 0$.

$$p(x) = a(x^3 - 2x) + b(x^2 - 5)$$

$$p(2) = a(2^3 - 2(2)) + b(2^2 - 5)$$

$$= a(8 - 4) + b(4 - 5)$$

$$= 4a - b = 0$$

4. B

If $(x - a)$ is a factor of $f(x)$, then $f(a)$ must be equal to 0. Based on the table, $f(-3) = 0$.

Therefore, $x + 3$ must be a factor of $f(x)$.

5. 8

$$x^3 - 8x^2 + 3x - 24 = 0$$

$$(x^3 - 8x^2) + (3x - 24) = 0 \quad \text{Group terms.}$$

$$x^2(x - 8) + 3(x - 8) = 0 \quad \text{Factor out the GCF.}$$

$$(x^2 + 3)(x - 8) = 0 \quad \text{Distributive Property}$$

$$x^2 + 3 = 0 \text{ or } x - 8 = 0 \quad \text{Solutions}$$

Since $x^2 + 3 = 0$ does not have a real solution, $x - 8 = 0$, or $x = 8$, is the only solution that makes the equation true.

6. 3

$$x^4 - 8x^2 = 9$$

$$x^4 - 8x^2 - 9 = 0 \quad \text{Make one side 0.}$$

$$(x^2 - 9)(x^2 + 1) = 0 \quad \text{Factor.}$$

$$(x + 3)(x - 3)(x^2 + 1) = 0 \quad \text{Factor.}$$

Since $x^2 + 1 = 0$ does not have a real solution, the solutions for x are $x = -3$ and $x = 3$.

Since it is given that $x > 0$, $x = 3$ is the only solution to the equation.

Section 13-3

1. B

$$a^{-\frac{1}{2}} = \frac{1}{a^{\frac{1}{2}}} = \frac{1}{\sqrt{a}}$$

2. C

$$\frac{1}{3 - 2\sqrt{2}}$$

$$= \frac{1}{3 - 2\sqrt{2}} \cdot \frac{3 + 2\sqrt{2}}{3 + 2\sqrt{2}}$$

Multiply the conjugate of the denominator.

$$= \frac{3 + 2\sqrt{2}}{(3)^2 - (2\sqrt{2})^2}$$

$$(a - b)(a + b) = a^2 - b^2$$

$$= \frac{3 + 2\sqrt{2}}{9 - 8}$$

Simplify.

$$= 3 + 2\sqrt{2}$$

3. B

$$(x + 1)^3 = -64$$

$$x + 1 = \sqrt[3]{-64}$$

Definition of cube root.

$$x + 1 = -4$$

$$\sqrt[3]{-64} = (-64)^{\frac{1}{3}} = -4$$

$$x = -5$$

Subtract 1 from each side.

4. A

$$\sqrt{8} + \sqrt{18} - \sqrt{32}$$

$$= \sqrt{4}\sqrt{2} + \sqrt{9}\sqrt{2} - \sqrt{16}\sqrt{2}$$

$$= 2\sqrt{2} + 3\sqrt{2} - 4\sqrt{2}$$

$$= \sqrt{2}$$

5. D

$$\begin{aligned}
 (1+\sqrt{3})(2-\sqrt{3}) &= 2-\sqrt{3}+2\sqrt{3}-\sqrt{3}\sqrt{3} && \text{FOIL} \\
 &= 2+\sqrt{3}-3 && \text{Combine like radicals.} \\
 &= -1+\sqrt{3} && \text{Simplify.}
 \end{aligned}$$

6. D

$$b^{\frac{5}{3}} = b^1 \cdot b^{\frac{2}{3}} = b \cdot (b^2)^{\frac{1}{3}} = b \cdot \sqrt[3]{b^2}$$

Section 13-4

1. B

$$\begin{aligned}
 11-\sqrt{2x+3} &= 8 \\
 11-\sqrt{2x+3}-11 &= 8-11 && \text{Subtract 11 from each side.} \\
 -\sqrt{2x+3} &= -3 && \text{Simplify.} \\
 (-\sqrt{2x+3})^2 &= (-3)^2 && \text{Square each side.} \\
 2x+3 &= 9 && \text{Simplify.} \\
 2x &= 6 && \text{Subtract 3 from each side.} \\
 x &= 3 && \text{Divide each side by 2.}
 \end{aligned}$$

2. A

$$\begin{aligned}
 \sqrt{-3x+4} &= 7 \\
 (\sqrt{-3x+4})^2 &= (7)^2 && \text{Square each side.} \\
 -3x+4 &= 49 && \text{Simplify.} \\
 -3x &= 45 && \text{Subtract 4 from each side.} \\
 x &= -15 && \text{Divide each side by } -3.
 \end{aligned}$$

3. B

$$\begin{aligned}
 \sqrt{x+18} &= x-2 \\
 (\sqrt{x+18})^2 &= (x-2)^2 && \text{Square each side.} \\
 x+18 &= x^2-4x+4 && \text{Simplify.} \\
 0 &= x^2-5x-14 && \text{Make one side 0.} \\
 0 &= (x-7)(x+2) && \text{Factor.} \\
 0 &= x-7 \text{ or } 0 = x+2 && \text{Zero Product Property} \\
 7 &= x \text{ or } -2 = x
 \end{aligned}$$

Check each x -value in the original equation.

$$\begin{aligned}
 \sqrt{7+18} &= 7-2 && x=7 \\
 \sqrt{25} &= 5 && \text{Simplify.} \\
 5 &= 5 && \text{True} \\
 \sqrt{-2+18} &= -2-2 && x=-2 \\
 \sqrt{16} &= -4 && \text{Simplify.} \\
 4 &= -4 && \text{False}
 \end{aligned}$$

Thus, 7 is the only solution.

4. C

$$\begin{aligned}
 \sqrt{5x-12} &= 3\sqrt{2} \\
 (\sqrt{5x-12})^2 &= (3\sqrt{2})^2 && \text{Square each side.} \\
 5x-12 &= 18 && \text{Simplify.} \\
 5x &= 30 && \text{Add 12 to each side.} \\
 x &= 6 && \text{Divide by 5 on each side.}
 \end{aligned}$$

5. $\frac{5}{9}$

$$\begin{aligned}
 \sqrt{2-3x} &= \frac{1}{3}a \\
 \sqrt{2-3x} &= \frac{1}{3}\sqrt{3} && a=\sqrt{3} \\
 (\sqrt{2-3x})^2 &= \left(\frac{1}{3}\sqrt{3}\right)^2 && \text{Square each side.} \\
 2-3x &= \frac{1}{3} && \text{Simplify.} \\
 -3x &= -\frac{5}{3} && \text{Subtract 2 from each side.} \\
 -\frac{1}{3}(-3x) &= -\frac{1}{3}\left(-\frac{5}{3}\right) && \text{Multiply each side by } -\frac{1}{3}. \\
 x &= \frac{5}{9} && \text{Simplify.}
 \end{aligned}$$

6. 2

$$\begin{aligned}
 \sqrt[3]{x-k} &= -2 \\
 (\sqrt[3]{x-k})^3 &= (-2)^3 && \text{Cube each side.} \\
 x-k &= -8 && \text{Simplify.} \\
 x-(8-\sqrt{2}) &= -8 && k=8-\sqrt{2} \\
 x-8+\sqrt{2} &= -8 && \text{Simplify.} \\
 x+\sqrt{2} &= 0 && \text{Add 8 to each side.} \\
 x &= -\sqrt{2} && \text{Subtract } \sqrt{2}. \\
 (x)^2 &= (-\sqrt{2})^2 && \text{Square each side.} \\
 x^2 &= 2 && \text{Simplify.}
 \end{aligned}$$

Section 13-5

1. B

$$\begin{aligned}
 \sqrt{-1}-\sqrt{-4}+\sqrt{-9} &= i-i\sqrt{4}+i\sqrt{9} && i=\sqrt{-1} \\
 &= i-2i+3i \\
 &= 2i
 \end{aligned}$$

2. C

$$\begin{aligned}
 &\sqrt{-2} \cdot \sqrt{-8} \\
 &= i\sqrt{2} \cdot i\sqrt{8} & \sqrt{-2} = i\sqrt{2}, \sqrt{-8} = i\sqrt{8} \\
 &= i^2 \sqrt{16} \\
 &= -4 & i^2 = -1
 \end{aligned}$$

3. D

$$\begin{aligned}
 &\frac{3-i}{3+i} \\
 &= \frac{3-i}{3+i} \cdot \frac{3-i}{3-i} & \text{Rationalize the denominator.} \\
 &= \frac{9-6i+i^2}{9-i^2} & \text{FOIL} \\
 &= \frac{9-6i-1}{9+1} & i^2 = -1 \\
 &= \frac{8-6i}{10} & \text{Simplify.} \\
 &= \frac{4-3i}{5} \text{ or } \frac{4}{5} - \frac{3i}{5}
 \end{aligned}$$

4. C

$$\begin{aligned}
 &\frac{1}{2}(5i-3) - \frac{1}{3}(4i+5) \\
 &= \frac{5}{2}i - \frac{3}{2} - \frac{4i}{3} - \frac{5}{3} & \text{Distributive Property} \\
 &= \frac{15}{6}i - \frac{9}{6} - \frac{8i}{6} - \frac{10}{6} & 6 \text{ is the GCD.} \\
 &= \frac{7}{6}i - \frac{19}{6} & \text{Simplify.}
 \end{aligned}$$

5. 23

$$\begin{aligned}
 (4+i)^2 &= a+bi \\
 16+8i+i^2 &= a+bi & \text{FOIL} \\
 16+8i-1 &= a+bi & i^2 = -1 \\
 15+8i &= a+bi & \text{Simplify.} \\
 15 &= a \text{ and } 8 = b & \text{Definition of Equal Complex Numbers}
 \end{aligned}$$

Therefore, $a+b=15+8=23$.

6. 2

$$\begin{aligned}
 \frac{3-i}{1-2i} &= \frac{3-i}{1-2i} \cdot \frac{1+2i}{1+2i} = \frac{3+6i-i-2i^2}{1-4i^2} \\
 &= \frac{3+6i-i+2}{1+4} = \frac{5+5i}{5} = 1+i = a+bi
 \end{aligned}$$

Therefore, $a=1$ and $b=1$, and $a+b=1+1=2$.

Chapter 13 Practice Test

1. C

$$f(x) = 2x^3 + bx^2 + 4x - 4$$

 $f\left(\frac{1}{2}\right) = 0$ because the graph of f intersects the

 x -axis at $\left(\frac{1}{2}, 0\right)$.

$$f\left(\frac{1}{2}\right) = 2\left(\frac{1}{2}\right)^3 + b\left(\frac{1}{2}\right)^2 + 4\left(\frac{1}{2}\right) - 4 = 0$$

Solving the equation for b gives $b=7$.

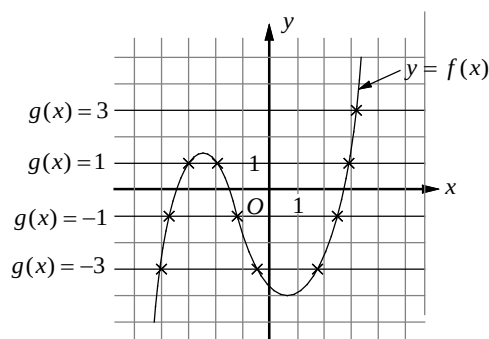
$$\text{Thus } f(x) = 2x^3 + 7x^2 + 4x - 4.$$

Also $k = f(-2)$, because $(-2, k)$ lies on the graph of f .

$$k = f(-2) = 2(-2)^3 + 7(-2)^2 + 4(-2) - 4$$

Solving the equation for k gives $k=0$.

2. D


 $g(x) = -3$ has 3 points of intersection with $y = f(x)$, so there are 3 real solutions.

 $g(x) = -1$ has 3 points of intersection with $y = f(x)$, so there are 3 real solutions.

 $g(x) = 1$ has 3 points of intersection with $y = f(x)$, so there are 3 real solutions.

 $g(x) = 3$ has 1 point of intersection with $y = f(x)$, so there is 1 real solution.

Choice D is correct

3. B

If $x+2$ is a factor of

$$f(x) = -(x^3 + 3x^2) - 4(x-a), \text{ then } f(-2) = 0.$$

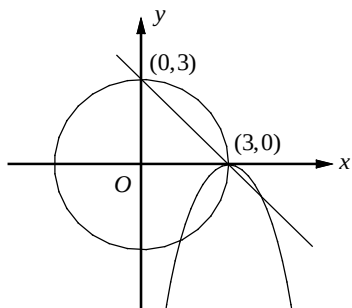
$$f(-2) = -((-2)^3 + 3(-2)^2) - 4(-2-a) = 0$$

$$-(-8+12)+8+4a=0$$

$$4+4a=0$$

$$a=-1$$

4. A



The solutions to the system of equations are the points where the circle, parabola, and line all intersect. That point is $(3, 0)$ and is therefore the only solution to the system.

5. C

$$\begin{aligned} \frac{(1-i)^2}{1+i} &= \frac{1-2i+i^2}{1+i} && \text{FOIL the numerator.} \\ &= \frac{1-2i-1}{1+i} && i^2 = -1 \\ &= \frac{-2i}{1+i} && \text{Simplify.} \\ &= \frac{-2i}{1+i} \cdot \frac{1-i}{1-i} && \text{Rationalize the denominator.} \\ &= \frac{-2i+2i^2}{1-i^2} && \text{FOIL} \\ &= \frac{-2i-2}{2} && i^2 = -1 \\ &= -i-1 \end{aligned}$$

6. B

$$a \sqrt[3]{a} = a \cdot a^{\frac{1}{3}} = a^{1+\frac{1}{3}} = a^{\frac{4}{3}}$$

7. B

$$p(x) = -2x^3 + 4x^2 - 10x$$

$$q(x) = x^2 - 2x + 5$$

In $p(x)$, factoring out the GCF, $-2x$, yields

$$p(x) = -2x(x^2 - 2x + 5) = -2x \cdot q(x).$$

Let's check each answer choice.

$$\begin{aligned} \text{A) } f(x) &= p(x) - \frac{1}{2}q(x) \\ &= -2x \cdot q(x) - \frac{1}{2}q(x) = (-2x - \frac{1}{2})q(x) \end{aligned}$$

$q(x)$ is not a factor of $x-1$ and $(-2x - \frac{1}{2})$ is not a factor of $x-1$. $f(x)$ is not divisible by $x-1$.

$$\begin{aligned} \text{B) } g(x) &= -\frac{1}{2}p(x) - q(x) \\ &= -\frac{1}{2}[-2x \cdot q(x)] - q(x) = (x-1)q(x) \end{aligned}$$

Since $g(x)$ is $x-1$ times $q(x)$, $g(x)$ is divisible by $x-1$.

Choices C and D are incorrect because $x-1$ is not a factor of the polynomials $h(x)$ and $k(x)$.

8. D

$$\begin{aligned} \sqrt{2x+6} &= x+3 \\ (\sqrt{2x+6})^2 &= (x+3)^2 && \text{Square each side.} \\ 2x+6 &= x^2+6x+9 && \text{Simplify.} \\ x^2+4x+3 &= 0 && \text{Make one side 0.} \\ (x+1)(x+3) &= 0 && \text{Factor.} \\ x+1=0 \text{ or } x+3=0 &&& \text{Zero Product Property} \\ x=-1 \text{ or } x=-3 \end{aligned}$$

Check each x -value in the original equation.

$$\begin{aligned} \sqrt{2(-1)+6} &= -1+3 && x=-1 \\ \sqrt{4} &= 2 && \text{Simplify.} \\ 2 &= 2 && \text{True} \\ \sqrt{2(-3)+6} &= -3+3 && x=-3 \\ 0 &= 0 && \text{True} \end{aligned}$$

Thus, -1 and -3 are both solutions to the equation.

9. C

Use the remainder theorem.

$$p\left(\frac{1}{2}\right) = 24\left(\frac{1}{2}\right)^3 - 36\left(\frac{1}{2}\right)^2 + 14 = 8$$

Therefore, the remainder of polynomial

$$p(x) = 24x^3 - 36x^2 + 14 \text{ divided by } x - \frac{1}{2} \text{ is } 8.$$

10. D

If $(x-a)$ is a factor of $f(x)$, then $f(a)$ must equal to 0. Thus, if $x+2$, $x+1$ and $x-1$ are factors of f , we have $f(-2) = f(-1) = f(1) = 0$.

Choice D is correct.

