

PRECALC MATH 11 - PRACTICE MIDTERM

Multiple Choice

Identify the choice that best completes the statement or answers the question.

1. Which of these sequences has a common difference of -10 ?

A. 2.5, 11, 19.5, 28	C. 8, -2 , -12 , -22
B. 2, -7 , -17 , -27	D. -10.5 , -9.5 , -8.5 , -7.5

2. Determine t_{11} of this arithmetic sequence: $-20, -35, -50, -65, \dots$

A. $t_{11} = -80$	C. $t_{11} = -15$
B. $t_{11} = -170$	D. $t_{11} = -20$

3. The general term of an arithmetic sequence is: $t_n = -17 + (-4)(n - 1)$
 Determine the first 4 terms of the sequence.

A. $-21, -25, -29, -33$	C. $-17, -25, -33, -41$
B. $-17, -4, -25, -29$	D. $-17, -21, -25, -29$

4. Determine the sum of the given terms of this arithmetic series: $5 + 8 + 11 + 14 + 17 + 20 + 23 + 26$

A. 104	C. 124
B. 520	D. 69

5. Determine the sum of the first 23 terms of this arithmetic series: $9 + 5 + 1 - 3 - 7 - 11 - 15 - 19 - \dots$

A. $S_{23} = -344$	C. $S_{23} = -8176.5$
B. $S_{23} = -908.5$	D. $S_{23} = -805$

6. An arithmetic series has $t_{11} = 17$ and $S_{11} = 132$; determine t_1 .

A. $t_1 = -7$	C. $t_1 = 1$
B. $t_1 = 7$	D. $t_1 = 8$

7. Which sequence could be geometric?

A. 4, 12, 20, 28, ...	C. 8, 39, 70, 101, ...
B. $-4, -16, -64, -256, \dots$	D. $-4, -3.1, -2.2, -1.3, \dots$

8. Determine the 8th term of this geometric sequence: 7, 21, 63, 189, ...

A. 45 927	C. 21 870
B. 19 683	D. 15 309

9. Write the first 4 terms of the geometric sequence with $t_1 = 405$ and $r = -\frac{1}{3}$.

A. 405, -135 , 45, -15	C. 405, 135, -45 , 15
B. 405, $-\frac{1}{135}$, $\frac{1}{45}$, $-\frac{1}{15}$	D. 405, -1215 , 3645, -10935

10. The sum of the first 7 terms of which geometric series is 508?

A. $4 + 8 + 16 + \dots + 256$	C. $2 + 8 + 16 + \dots + 128$
B. $3 + 6 + 12 + \dots + 192$	D. $5 + 10 + 20 + \dots + 320$

11. Determine the sum of the first 5 terms of this geometric series: $18 + 6 + 2 + \dots$
- A. 27
B. 36
C. 45
D. 26.89
12. Determine the common ratio of a geometric series that has these partial sums: $S_4 = -3.5$, $S_5 = -3.75$, $S_6 = -3.875$
- A. $r = 1$
B. $r = -2$
C. $r = -0.5$
D. $r = 0.5$
13. Determine the common ratio of this infinite geometric series: $-5 + 2 - \frac{4}{5} + \frac{8}{25} - \dots$
- Does the series have a finite sum?
- A. $r = -0.4$, so the sum is finite.
B. $r = -\frac{4}{5}$, so the sum is finite.
C. $r = -3.57$, so the sum is not finite.
D. $r = -\frac{2}{5}$, so the sum is finite.
14. An infinite geometric series has $t_1 = 5$ and $r = -2$. Determine S_∞ .
- A. $S_\infty = 5$
B. The sum is not finite.
C. $S_\infty = 2$
D. $S_\infty = -4$
15. What is the distance between $1\frac{4}{5}$ and $-2\frac{1}{5}$ on a number line?
- A. $2\frac{1}{2}$
B. 4
C. $\frac{1}{4}$
D. $\frac{2}{5}$
16. Evaluate: $|-11 + (-1)| - 7|7 - (21)|$
- A. -86
B. -208
C. 266
D. -206
17. Evaluate $|x^2 + (-5)x + (7)|$ when $x = -5$.
- A. 57
B. 50
C. 27
D. 123
18. Write this mixed radical as an entire radical: $5^3\sqrt{5}$
- A. $\sqrt[5]{25}$
B. $\sqrt[5]{625}$
C. $\sqrt[5]{125}$
D. $\sqrt[5]{15625}$
19. Write this entire radical as a mixed radical: $\sqrt[3]{-320}$
- A. $-4^3\sqrt{5}$
B. $-8^3\sqrt{10}$
C. $-4^3\sqrt{25}$
D. $-8^3\sqrt{5}$
20. For which values of the variable, x , is this radical defined?
- $\sqrt{78x^2}$
- A. $x \in \mathbb{R}$
B. $x \leq 0$
C. $x \geq 0$
D. $x > 0$
21. Write this radical in simplest form: $\sqrt{63a^9b^8}$
- Then state the values of the variables, a and b , for which the radical is defined.
- A. $3a^4b^4\sqrt{7a}$; $a \in \mathbb{R}, b \geq 0$
B. $3ab\sqrt{7a^4b^4}$; $a \geq 0, b \in \mathbb{R}$
C. $3ab\sqrt{7a^4b^4}$; $a \in \mathbb{R}, b \geq 0$
D. $3a^4b^4\sqrt{7a}$; $a \geq 0, b \in \mathbb{R}$

22. Simplify by adding or subtracting like terms: $8\sqrt{13} - 7\sqrt{13} + 5\sqrt{13}$
 A. $6\sqrt{13}$ B. $\sqrt{78}$ C. $10\sqrt{13}$ D. $6\sqrt{10}$
23. Simplify by adding or subtracting like terms: $\sqrt{9} + \sqrt{125} - \sqrt{81} + \sqrt{3125}$
 A. $30\sqrt{5} - 6$ C. $-8\sqrt{5}$
 B. $-8\sqrt{3}$ D. $30\sqrt{3} - 6$
24. Simplify by adding or subtracting like terms: $\sqrt[3]{64w^2} - 4\sqrt[3]{w^2} - \sqrt[3]{8w^2}, w \in \mathbb{R}$
 A. $2\sqrt[3]{w^2}$ B. $-2\sqrt[3]{w^2}$ C. $10\sqrt[3]{w^2}$ D. $6\sqrt[3]{w^2}$
25. Expand and simplify this expression: $-\sqrt{2}(\sqrt{7} - 5)$
 A. $-7\sqrt{2} + \sqrt{10}$ C. $-\sqrt{14} + 5\sqrt{2}$
 B. $-2\sqrt{7} + 5\sqrt{2}$ D. $\sqrt{14} - \sqrt{10}$
26. Expand and simplify this expression: $(\sqrt{7} + 7)(\sqrt{3} - 2)$
 A. $\sqrt{21} - 14\sqrt{7} - 14$ C. $7\sqrt{3} - 2\sqrt{7} + 7\sqrt{7} - 14$
 B. $\sqrt{21} - 2\sqrt{7} + 7\sqrt{3} - 14$ D. $\sqrt{21} + 3\sqrt{7} + 7\sqrt{3} + \sqrt{49}$
27. Expand and simplify this expression: $\sqrt{a}(3\sqrt{a} - 2), a \geq 0$
 A. $3a - 2\sqrt{a}$ C. $\sqrt{3a} - 2$
 B. $3\sqrt{a} - 2a$ D. $\sqrt{3a} - 2$
28. Simplify this expression: $\frac{-9\sqrt{5} - 3}{\sqrt{5}}$
 A. $\frac{-45 - 3\sqrt{5}}{5}$ C. $\frac{-9 - 15\sqrt{5}}{5}$
 B. $-225 - 3\sqrt{5}$ D. $\frac{-45\sqrt{5} - 15}{5}$
29. Simplify this expression: $\frac{-8\sqrt{7} + 5\sqrt{3}}{\sqrt{7} - \sqrt{3}}$
 A. $\frac{-41 + 40\sqrt{21}}{4}$ C. $\frac{-71 + 40\sqrt{21}}{4}$
 B. $\frac{-41 - 3\sqrt{21}}{4}$ D. $\frac{-71 - 3\sqrt{21}}{21}$
30. Solve this equation: $9\sqrt{4x} = 72$
 A. $x = 16$ B. $x = 64$ C. $x = \frac{1}{8}$ D. $x = 8$
31. Solve this equation: $-4\sqrt{x} - 43 = -10\sqrt{x} - 7$
 A. $x = 12$ B. $x = 36$ C. $x = 6$ D. $x = 25$

32. Solve this equation: $3x = \sqrt{30 + 3x}$
- A. $x = 2$ and $x = -\frac{5}{3}$ C. $x = -2$
 B. $x = 2$ D. $x = -\frac{5}{3}$
33. Solve this equation: $\frac{\sqrt{2x + 54}}{2} = 4$
- A. $x = \frac{5}{2}$ B. $x = 25$ C. $x = 5$ D. $x = 10$
34. Factor: $49b^2 - 64$
- A. $(7b - 8)(7b - 8)$ C. $(7b + 8)(7b - 8)$
 B. $(8b + 7)(8b - 7)$ D. $(7b + 8)(7b + 8)$
35. Factor: $25m^2 - 40m + 16$
- A. $(5m - 16)(5m - 1)$ C. $(5m + 4)^2$
 B. $(5m - 4)(5m + 4)$ D. $(5m - 4)^2$
36. Factor this polynomial: $\frac{15}{4} - x - x^2$
- A. $\frac{1}{4}(5 - 2x)(3 + 2x)$ C. $\frac{1}{2}(5 + 2x)(3 - 4x)$
 B. $\frac{1}{2}(5 - 2x)(3 + 4x)$ D. $\frac{1}{4}(5 + 2x)(3 - 2x)$
37. Factor this polynomial expression: $2(3x - 2)^2 + 9(3x - 2) - 5$
- A. $3(x + 1)(6x - 5)$ C. $2(3x + 2)(x - 5)$
 B. $2(3x - 2)(x + 5)$ D. $3(x - 1)(6x + 5)$
38. Which statement is true for the equation $x = \sqrt{6x + 7}$?
- A. 7 and -1 are roots.
 B. 7 is a root of the original equation and -1 is an extraneous root.
 C. 1 is a root of the original equation and -7 is an extraneous root.
 D. 7 and 1 are both extraneous roots.
39. Solve by factoring: $x^2 + 4x - 21 = 0$
- A. $x = -7$ or $x = 3$ C. $x = 7$ or $x = -3$
 B. $x = -7$ or $x = -3$ D. $x = 7$ or $x = 3$
40. Solve this equation: $(x - 1)^2 - 7 = 24$
- A. $x = 1 \pm \sqrt{17}$ C. $x = -1 \pm \sqrt{31}$
 B. $x = 1 \pm \sqrt{31}$ D. $x = -1 \pm \sqrt{17}$
41. Determine the value of \square that makes $x^2 + 10x + \square$ a perfect square.
- A. 25 B. 10 C. 100 D. 625

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Answer Section

MULTIPLE CHOICE

1. ANS: C	DIF: Easy	REF: 1.1 Arithmetic Sequences
2. ANS: B	DIF: Easy	REF: 1.1 Arithmetic Sequences
3. ANS: D	DIF: Easy	REF: 1.1 Arithmetic Sequences
4. ANS: C	DIF: Easy	REF: 1.2 Arithmetic Series
5. ANS: D	DIF: Easy	REF: 1.2 Arithmetic Series
6. ANS: B	DIF: Moderate	REF: 1.2 Arithmetic Series
7. ANS: B	DIF: Easy	REF: 1.3 Geometric Sequences
8. ANS: D	DIF: Easy	REF: 1.3 Geometric Sequences
9. ANS: A	DIF: Moderate	REF: 1.3 Geometric Sequences
10. ANS: A	DIF: Moderate	REF: 1.4 Geometric Series
11. ANS: D	DIF: Easy	REF: 1.4 Geometric Series
12. ANS: D	DIF: Moderate	REF: 1.4 Geometric Series
13. ANS: D	DIF: Easy	REF: 1.6 Infinite Geometric Series
14. ANS: B	DIF: Easy	REF: 1.6 Infinite Geometric Series
15. ANS: B	DIF: Moderate	REF: 2.1 Absolute Value of a Real Number
16. ANS: A	DIF: Moderate	REF: 2.1 Absolute Value of a Real Number
17. ANS: A	DIF: Moderate	REF: 2.1 Absolute Value of a Real Number
18. ANS: D	DIF: Easy	REF: 2.2 Simplifying Radical Expressions
19. ANS: A	DIF: Moderate	REF: 2.2 Simplifying Radical Expressions
20. ANS: A	DIF: Moderate	REF: 2.2 Simplifying Radical Expressions
21. ANS: D	DIF: Difficult	REF: 2.2 Simplifying Radical Expressions
22. ANS: A	DIF: Easy	REF: 2.3 Adding and Subtracting Radical Expressions
23. ANS: A	DIF: Moderate	REF: 2.3 Adding and Subtracting Radical Expressions
24. ANS: B	DIF: Easy	REF: 2.3 Adding and Subtracting Radical Expressions
25. ANS: C	DIF: Easy	REF: 2.4 Multiplying and Dividing Radical Expressions
26. ANS: B	DIF: Easy	REF: 2.4 Multiplying and Dividing Radical Expressions
27. ANS: A	DIF: Moderate	REF: 2.4 Multiplying and Dividing Radical Expressions
28. ANS: A	DIF: Moderate	REF: 2.4 Multiplying and Dividing Radical Expressions
29. ANS: B	DIF: Moderate	REF: 2.4 Multiplying and Dividing Radical Expressions
30. ANS: A	DIF: Easy	REF: 2.5 Solving Radical Equations
31. ANS: B	DIF: Moderate	REF: 2.5 Solving Radical Equations
32. ANS: B	DIF: Moderate	REF: 2.5 Solving Radical Equations
33. ANS: C	DIF: Moderate	REF: 2.5 Solving Radical Equations
34. ANS: C	DIF: Easy	REF: 3.1 Factoring Polynomial Expressions
35. ANS: D	DIF: Easy	REF: 3.1 Factoring Polynomial Expressions
36. ANS: D	DIF: Moderate	REF: 3.1 Factoring Polynomial Expressions
37. ANS: A	DIF: Moderate	REF: 3.1 Factoring Polynomial Expressions
38. ANS: B	DIF: Moderate	REF: 3.2 Solving Quadratic Equations by Factoring
39. ANS: A	DIF: Easy	REF: 3.2 Solving Quadratic Equations by Factoring
40. ANS: B	DIF: Easy	REF: 3.3 Using Square Roots to Solve Quadratic Equations

41. ANS: A	DIF: Easy	REF: 3.3 Using Square Roots to Solve Quadratic Equations
42. ANS: A	DIF: Moderate	REF: 3.3 Using Square Roots to Solve Quadratic Equations
43. ANS: D	DIF: Easy	REF: 3.3 Using Square Roots to Solve Quadratic Equations
44. ANS: C	DIF: Moderate	REF: 3.4 Developing and Applying the Quadratic Formula
45. ANS: D	DIF: Moderate	REF: 3.4 Developing and Applying the Quadratic Formula
46. ANS: B	DIF: Moderate	REF: 3.4 Developing and Applying the Quadratic Formula
47. ANS: A	DIF: Easy	REF: 3.5 Interpreting the Discriminant
48. ANS: D	DIF: Easy	REF: 3.5 Interpreting the Discriminant