

AL HUDA SCIENCE ACADEMY

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Most Important MCQs of Math

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Chapter 1: Real Numbers**1. The Sumerians used which numeral system?**

A. Base 10 | B. Base 60 | C. Base 2 | D. Base 12

Answer: B**2. The concept of zero was first developed by:**

A. Egyptians | B. Sumerians | C. Indians | D. Greeks

Answer: C**3. Modern number systems like hexadecimal are based on:**

A. Base 10 | B. 3.14 | C. Base 2 | D. Base 16

Answer: D**4. Which of these is an irrational number?**A. 0.333... | B. $\sqrt{16}$ | C. $\sqrt{5}$ | D. 2332**Answer: C****5. A recurring decimal is always a:**

A. Rational number | B. Irrational number | C. Integer | D. Whole number

Answer: A**6. Which number is rational?**A. $\sqrt{3}$ | B. e | C. $\sqrt{5}$ | D. $1/6$ **Answer: D****7. 0.6 is equivalent to:**A. $2/3$ | B. $3/5$ | C. $1/6$ | D. $6/99$ **Answer: A****8. The decimal expansion of $1/7$ is:**

A. Terminating | B. Non-terminating and non-recurring | C. Non-terminating and recurring | D. None of these

Answer: C**9. Which property is illustrated by $a + b = b + a$?**

A. Associative | B. Identity | C. Distributive | D. Commutative

Answer: D**10. The additive identity for real numbers is:**

A. 1 | B. 0 | C. -1 | D. None of these

Answer: B**11. Which property states $a(b + c) = ab + ac$?**

A. Associative | B. Distributive | C. Inverse | D. Closure

Answer: B**12. The multiplicative inverse of 5 is:**A. -5 | B. $1/5$ | C. 0 | D. 1**Answer: B****13. If $a > b$ and $b > c$ then $a > c$ is called property:**

A. Reflexive | B. Symmetric | C. Transitive | D. Trichotomy

Answer: C**14. Which of the following is not an integer?**

A. -3 | B. 0 | C. 4.5 | D. 7

Answer: C**15. Which of the following is an example of a rational number?**A. π | B. $3/4$ | C. $\sqrt{2}$ | D. e **Answer: B****16. What is the example of a recurring decimal?**

A. 3.14159265... | B. 0.3333... | C. 2.718281828... | D. 0.49835555

Answer: B**17. Which number set does the number 0 belong to?**

A. Whole number | B. Natural number | C. Irrational number | D. None of these

Answer: A**18. Which of the following is an example of an infinite non-recurring decimal?**A. 0.25 | B. 0.333... | C. 5.75 | D. π **Answer: D****19. Which number system does -3 belong to:**

A. Natural number | B. Whole number | C. Integers | D. Irrational number

Answer: C

20. Which of the following is not a real number:

A. 5 | B. -2 | C. $\sqrt{7}$ | D. Undefined

Answer: D

21. What is the square root of 16?

A. 4 | B. -4 | C. Both a and b | D. None of these

Answer: C

22. The value of $\sqrt{25}$ is:

A. 5 | B. -5 | C. Both a and b | D. None of these

Answer: A

23. Which is equivalent to $(\sqrt{3}+\sqrt{2})/(\sqrt{3}-\sqrt{2})$?

A. $5 + 2\sqrt{6}$ | B. 1 | C. $\sqrt{6}$ | D. $5 - 2\sqrt{6}$

Answer: A

24. If $x = 1 + \sqrt{2}$ then $x^2 = ?$

A. $2\sqrt{2}$ | B. $1 + 2\sqrt{2}$ | C. 3 | D. $3 + 2\sqrt{2}$

Answer: D

25. If $a + b = 10$ and $ab = 21$ then $a^2 + b^2 = ?$

A. 58 | B. 100 | C. 42 | D. 21

Answer: A

26. The solution of $2x = 16$ is:

A. 6 | B. 8 | C. 2 | D. 4

Answer: B

27. The solution of $2x + 5 = 15$ is:

A. $x = 3$ | B. $x = 10$ | C. $x = 7.5$ | D. $x = 5$

Answer: D

28. If $\sqrt{x} = 5$, then $x = ?$

A. 10 | B. 25 | C. 5 | D. 15

Answer: B

29. The value of $(\sqrt{12} \times \sqrt{3})/\sqrt{4}$ is:

A. 3 | B. 6 | C. 9 | D. 12

Answer: A

30. If $a = 3$, $b = 4$, then $\sqrt{a^2 + b^2} = ?$

A. 5 | B. 7 | C. 12 | D. 25

Answer: A

31. Which is a binomial surd?

A. $\sqrt{3}$ | B. $\sqrt{3} + \sqrt{5}$ | C. $2\sqrt{3}$ | D. $\sqrt{9}$

Answer: B

32. The conjugate of $\sqrt{7} - \sqrt{2}$:

A. $\sqrt{7} + \sqrt{2}$ | B. $\sqrt{7} - \sqrt{2}$ | C. $-\sqrt{7} + \sqrt{2}$ | D. $-\sqrt{7} - \sqrt{2}$

Answer: A

33. Rationalize the denominator $1/\sqrt{5}$:

A. $\sqrt{5}$ | B. $\sqrt{5}/5$ | C. $1/5$ | D. $5\sqrt{5}$

Answer: B

34. Which is not a surd?

A. $\sqrt{8}$ | B. $\sqrt{12}$ | C. $\sqrt{16}$ | D. $\sqrt{18}$

Answer: C

35. Convert 25°C to Fahrenheit using $F = 9/5C + 32$:

A. 77°F | B. 68°F | C. 90°F | D. 45°F

Answer: A

36. A profit of 20% on a cost price of Rs. 500 means the selling price is:

A. Rs 600 | B. Rs 400 | C. Rs 550 | D. Rs 700

Answer: A

37. Compound interest on Rs 2000 at 10% for 2 years is:

A. Rs 420 | B. Rs 200 | C. Rs 400 | D. Rs 240

Answer: A

38. If three consecutive integers sum to 51, the largest number is:

A. 15 | B. 16 | C. 17 | D. 18

Answer: D

39. If 5 pens cost Rs 45, the cost of 8 pens is:

A. 100 | B. 60 | C. 90 | D. 72

Answer: D

40. A number is increased by 20% and becomes 60. The original number is:

A. 50 | B. 48 | C. 60 | D. 72

Answer: A

41. Two numbers are in the ratio 3:4. Their sum is 35. The numbers are:

A. 15, 20 | B. 12, 16 | C. 9, 12 | D. 18, 24

Answer: A

Chapter 2: Logarithms

42. The value of $\sqrt{25}$ is:

A. 5 | B. -5 | C. Both a and b | D. None of these

Answer: A

43. $\log(5) + \log(3) =$

A. Log 0 | B. Log 2 | C. $\log(3)$ | D. Log 15

Answer: D

44. $3^4 = 81$ in logarithmic form is:

A. $\log_3(4) = 81$ | B. $\log_4(3) = 81$ | C. $\log_3(81) = 4$ | D. $\log_4(81) = 3$

Answer: C

Chapter 3: Sets and Functions

95. The sequence 0,1,1,2,3,5,8,13,21... is an example of a... sequence:

A. Roman | B. Odd | C. Even | D. Fibonacci

Answer: D

96. Georg Cantor was a... mathematician:

A. Japanese | B. German | C. Greek | D. Egyptian

Answer: B

97. Fibonacci sequence Formula $F_n = \dots$

A. $F_{n-1} + F_{n+2}$ | B. $F_{n-1} + F_{n-2}$ | C. $F_{n-1} - F_{n+2}$ | D. $F_{n-1} + F_n$

Answer: B

98. Names of sets are represented by:

A. 1,2,3,... | B. A,B,... | C. Both A and B | D. None of these

Answer: C

99. How many methods are there to describe a set?

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

Answer: C

100. Set $A = \{a, e, i, o, u\}$ is written in... form:

A. Descriptive | B. Tabular | C. Builder | D. None of these

Answer: B

101. Symbol used for 'member of' or 'belongs to' a set:

A. Σ | B. $\in$ | C. $\cap$ | D. $\cup$

Answer: B

102. Set $\{2,3,5,7,11,\dots\}$ is called the set of ... numbers:

A. Natural | B. Whole | C. Odd | D. Prime

Answer: D

103. $Q \cup Q' = \dots$

A. N | B. R | C. Q' | D. Q

Answer: B

104. The set $\{0\}$ is:

A. Singleton | B. Empty | C. Null | D. Prime

Answer: A

105. The set with no element is called an ... set:

A. Singleton set | B. Empty | C. Power | D. Prime

Answer: B

106. Symbol used for empty set:

A. $\{ \}$ or $\emptyset$ | B. $\in$ | C. $\{ \}$ | D. None of these

Answer: A

107. Example of equal sets:

A. $\{a,b,c\}$, $\{1,2,3\}$ | B. $\{1,2,3\}$, $\{2,1,3\}$ | C. Both a and b | D. None of these

Answer: B

108. Symbol used for equivalent sets A and B:

A. $A = B$ | B. $A \sim B$ | C. $A + B$ | D. $A \cup B$

Answer: B

109. If A is a subset of B, then it is written symbolically as:

A. $A \subseteq B$ | B. $A \supseteq B$ | C. $A \in B$ | D. $A \subset B$

Answer: A

110. Number of elements in the power set of $C = \{a, b, c, d\}$:

A. 8 | B. 16 | C. 24 | D. 32

Answer: B

111. If $D = \{a\}$ then, $P(D) = \dots$

A. $\{a\}$ | B. $\emptyset, \{a\}$ | C. $\{\emptyset, \{a\}\}$ | D. None of these

Answer: C

112. If S_1 = set of odd numbers, S_2 = set of even numbers, the intersection of both sets is:

A. Universal set | B. Empty set | C. Even set | D. Odd set

Answer: B

113. Which is an example of overlapping sets:

A. $\{1,2\}$, $\{2,3,4\}$ | B. $\{1,2\}$, $\{1,2,3,4\}$ | C. $\{1,2\}$, $\{3,4\}$ | D. None of these

Answer: A

115. If $A = \{1,2,3,4,5\}$ and $B = \{4,5,6,7,8,9,10\}$ then, $A - B = \dots$

A. $\{4,5\}$ | B. $\{1,2,3\}$ | C. $\{6,7,8,9,10\}$ | D. $\{4,5,6,7,8,9,10\}$

Answer: B

116. $A' = \dots$

A. $U - A$ | B. $A - U$ | C. U | D. $U + A$

Answer: A

117. $(A')' = \dots$

A. $U - A$ | B. $A - U$ | C. U | D. A

Answer: D

118. $(A \cup B)' = \dots$

A. $A' \cap B'$ | B. $A' \cup B'$ | C. $A \cap B'$ | D. $A' \cup B'$

Answer: A

119. $A \cap B = B \cap A$ is called the ... property of intersection:

A. Associative | B. Commutative | C. Distributive | D. None of these

Answer: B

120. If $A = \{1,3,5,7,9,11\}$ then $n(A) = \dots$?

A. 6 | B. 4 | C. 5 | D. 2

Answer: A

121. $n(A) + n(B) - n(A \cap B) = \dots$

A. $n(A \cap B)$ | B. $n(A \cup B)$ | C. $n(A - B)$ | D. None of these

Answer: B

125. Symbol used for intersection:

A. $\cup$ | B. $\in$ | C. $\cap$ | D. $-$

Answer: C

127. If $A \cap B = \{1,2,3\}$ and $A = \{1,2,3,7\}$, then a possible set B is:

A. $\{1,2,6\}$ | B. $\{1,2,3,4\}$ | C. $\{1,3,6\}$ | D. $\{1,6,7\}$

Answer: B

128. If $A \cap B = \emptyset$ then A and B are ... sets:

A. Subset | B. Overlapping | C. Disjoint | D. None of these

Answer: C

129. Each ordered pair consists of ... coordinates:

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

Answer: B

130. In the ordered pair (x,y) , x is called:

A. Abscissa | B. Ordinate | C. Both | D. None of these

Answer: A

131. If a function $f: A \rightarrow B$ is such that range $f \neq B$, then f is called an ... function.

A. Onto | B. Into | C. One-one | D. Bijective

Answer: B

132. If $f(n) = 2n - 1$ then $f(7)$ is:

A. 12 | B. 13 | C. 14 | D. 15

Answer: B

133. If $g(x) = x^2 - 3$ then $g(4)$ is:

A. 7 | B. -7 | C. 13 | D. 9

Answer: C

134. If $r = \{(1,2), (1,3), (2,3)\}$, then Domain(r) is:

A. $\{1,2\}$ | B. $\{1\}$ | C. $\{2,3\}$ | D. $\{1,2,3\}$

Answer: A

136. If $A = \{\}$, then $P(A)$ is:

A. $\{\}$ | B. $\{1\}$ | C. $\{\{\}\}$ or $\{\emptyset\}$ | D. $\emptyset$

Answer: C

137. If $U = \{1,2,3,4,5\}$, $A = \{1,2,3\}$ and $B = \{3,4,5\}$, then $U - (A \cap B)$ is:

A. $\{1,2,4,5\}$ | B. $\{2,3\}$ | C. $\{1,3,4,5\}$ | D. $\{1,2,3\}$

Answer: A

138. If A and B are overlapping sets, then $n(A - B)$ is equal to:

A. $n(A)$ | B. $n(B)$ | C. $n(A \cap B)$ | D. $n(A) - n(A \cap B)$

Answer: D

139. If $A \subseteq B$ and $B - A \neq \emptyset$, then $n(B - A)$ is equal to:

A. 0 | B. $n(B)$ | C. $n(A)$ | D. $n(B) - n(A)$

Answer: D

140. If $n(A \cup B) = 50$, $n(A) = 30$ and $n(B) = 35$ then $n(A \cap B) = \dots$

A. 23 | B. 15 | C. 10 | D. 40

Answer: B

141. If $A = \{1,2,3,4\}$ and $B = \{x, y, z\}$ then the Cartesian product of A and B contains exactly ... elements:

A. 13 | B. 12 | C. 10 | D. 6

Answer: B

142. If $f(x) = x^2 - 3x + 2$ then the value of $f(a + 1)$ is equal to:

A. $a + 1$ | B. $a^2 + 1$ | C. $a^2 - a$ | D. $a^2 - a$

Answer: D

143. Given that $f(x) = 3x + 1$, if $f(x) = 28$ then the value of x is:

A. 9 | B. 27 | C. 3 | D. 18

Answer: A

144. Let $A = \{1,2,3\}$, $B = \{a,b\}$ and $f = \{(1,a), (2,b), (3,b)\}$, then which statement is true?

A. f is injective | B. f is surjective | C. f is bijective | D. f is into only

Answer: D

Chapter 4: Factorization and Algebraic Manipulation

145. In $2x^2 + 7x + 3$, one factor is $(2x + 1)$ then the other factor is:

A. $(x + 2)$ | B. $(x + 1)$ | C. $(x + 3)$ | D. $(x + 4)$

Answer: C

146. An expression with two terms is called:

A. Monomial | B. Binomial | C. Trinomial | D. None of these

Answer: B

147. Common factor of $2x - 6$ is:

A. 2 | B. 3 | C. x | D. None of these

Answer: A

148. Factors of $x^2 - 3x - 10$ are:

A. $(x + 2)(x + 5)$ | B. $(x + 2)(x - 5)$ | C. $(x - 2)(x + 5)$ | D. $(x - 2)(x - 5)$

Answer: B

149. Which expression is a type of quadratic expression?

A. $ax + b$ | B. $ax^2 + bx + c$ | C. $ax^3 + bx^2 + c$ | D. None of these

Answer: B

150. Which pair is suitable for the factorization of $x^2 - 11x + 24$?

A. +3, +8 | B. -3, -8 | C. -3, +8 | D. +3, -8

Answer: B

151. An expression having degree 2 is called a ... expression.

A. Cubic | B. Linear | C. Quadratic | D. None of these

Answer: C

152. Factors of $3x^2 - 4x - 4$ are:

A. $(3x + 2)(x - 2)$ | B. $(3x - 2)(x + 2)$ | C. $(3x + 2)(x + 2)$ | D. None of these

Answer: A

153. Which of the following is a prime number?

A. 9 | B. 15 | C. 13 | D. 21

Answer: C

154. $a^2 - 2ab + b^2$ is equal to:

A. $(a + b)^2$ | B. $(a - b)^2$ | C. $a^2 - b^2$ | D. $a^2 + b^2$

Answer: B

155. Factors of $8x^3 + 27$ are:

A. $(2x + 3)(4x^2 + 6x + 9)$ | B. $(2x + 3)(4x^2 - 6x + 9)$ | C. $(2x - 3)(4x^2 + 6x + 9)$ | D. $(2x - 3)(4x^2 - 6x + 9)$

Answer: B

156. $a^3 + 3a^2b + 3ab^2 + b^3$ is equal to:

A. $(a + b)^3$ | B. $(a - b)^3$ | C. $a^3 - b^3$ | D. $a^3 + b^3$

Answer: A

157. How many methods are there to find the H.C.F.?

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

Answer: B

158. H.C.F of $6x^2y$, $9xy^2$ is:

A. $3x^2y$ | B. $3xy$ | C. $6x^2y$ | D. $54x^3y^3$

Answer: B

159. L.C.M =

A. $p(x) \times q(x) / \text{H.C.F}$ | B. $\text{H.C.F} \times p(x) / q(x)$ | C. $p(x) \times q(x) \times \text{H.C.F}$ | D. None of these

Answer: A

160. The square root of $a^2 - 2a + 1$ is:

A. $\pm(a - 1)$ | B. $\pm(a + 1)$ | C. $a - 1$ | D. $a + 1$

Answer: A

161. The factorization of $12x + 36$ is:

A. $12(x + 3)$ | B. $12(3x)$ | C. $12(3x + 1)$ | D. $x(12 + 36x)$

Answer: A

162. The factors of $4x^2 - 12x + 9$ are:

A. $(2x + 3)^2$ | B. $(2x - 3)^2$ | C. $(2x - 3)(2x + 3)$ | D. $(2 + 3x)(2 - 3x)^2$

Answer: B

163. The HCF of a^3b^3 and ab^2 is:

A. a^3b^3 | B. ab^2 | C. a^4b^5 | D. a^2b

Answer: B

164. The LCM of $16x^2$, $4x$ and $30xy$ is:

A. $480x^3y$ | B. $240xy$ | C. $240x^2y$ | D. $120x^4y$

Answer: C

165. Product of LCM and HCF = ... of two polynomials:

A. Sum | B. Difference | C. Product | D. Quotient

Answer: C

166. The square root of $x^2 - 6x + 9$ is:

A. $\pm(x - 3)$ | B. $\pm(x + 3)$ | C. $x - 3$ | D. $x + 3$

Answer: A

167. The LCM of $(a - b)^2$ and $(a - b)^4$ is:

A. $(a - b)^2$ | B. $(a - b)^3$ | C. $(a - b)^4$ | D. $(a - b)^6$

Answer: C

168. Factorization of $x^3 + 3x^2 + 3x + 1$ is:

A. $(x + 1)^3$ | B. $(x - 1)^3$ | C. $(x + 1)(x^2 + x + 1)$ | D. $(x - 1)(x^2 - x + 1)$

Answer: A

169. A cubic polynomial has degree:

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

Answer: C

170. One of the factors of $x^3 - 27$ is:

A. $x - 3$ | B. $x + 3$ | C. $x^2 - 3x + 9$ | D. Both a and c

Answer: A

Chapter 5: Linear Equations and Inequalities

171. Which of the following is a linear equation in one variable?

A. $2x + 3y = 7$ | B. $5x - 4 = 0$ | C. $x^2 + 3x = 8$ | D. $xy + 2 = 5$

Answer: B

172. The solution of the equation $3x - 7 = 2$ is:

A. 3 | B. -3 | C. $5/3$ | D. 9

Answer: A

173. In the inequality $4x + 2 > 10$, what is the solution for x?

A. $x > 2$ | B. $x < 2$ | C. $x \geq 2$ | D. $x \leq 2$

Answer: A

174. Which symbol represents 'less than or equal to'?

A. $>$ | B. $<$ | C. $\leq$ | D. $\geq$

Answer: C

175. The graphical representation of a linear equation in two variables is:

A. A curve | B. A straight line | C. A parabola | D. A circle

Answer: B

176. What is the solution of $2(x - 3) = 4$?

A. $x = 2$ | B. $x = 5$ | C. $x = 3$ | D. $x = 1$

Answer: B

177. The inequality $x - 5 \geq 3$ means:

A. x is greater than 8 | B. x is less than 8 | C. x is greater than or equal to 8 | D. x is less than or equal to 8

Answer: C

178. The equation $x + 2y = 6$ represents a:

A. Quadratic equation | B. Linear equation | C. Exponential equation | D. None of these

Answer: B

179. The associated equation of the inequality $x + 2y \leq 8$ is:

A. $x + 2y = 8$ | B. $x + 2y > 8$ | C. $x + 2y < 8$ | D. $x + 2y \geq 8$

Answer: A

180. The solution of the system $x - y = 2$ and $x + y = 6$ is:

A. (4, 2) | B. (2, 4) | C. (3, 3) | D. (6, 0)

Answer: A

181. If $x = 3$ is a solution of $5x - 2 = k$ then k is:

A. 11 | B. 13 | C. 15 | D. 17

Answer: B

182. What is the graphical representation of a system of linear inequalities?

A. A shaded region | B. A single point | C. A straight line | D. A curve

Answer: A

183. The equation $2x - y = 4$ is the associated equation for which inequality?

A. $2x - y > 4$ | B. $2x - y \leq 4$ | C. $2x - y \geq 4$ | D. All of the above

Answer: D

184. The solution region for a system of linear inequalities is called:

A. A vertex | B. A feasible region | C. A line | D. A parabola

Answer: B

185. The graph of $x + y \geq 5$ includes the line:

A. $x + y = 5$ | B. $x + y < 5$ | C. $x + y > 5$ | D. None of these

Answer: A

186. Which method is used to find the optimal solution of a linear programming problem?

A. Graphical method | B. Algebraic method | C. Simplex method | D. All of these

Answer: A

187. The equation $x = 2$ represents a:

A. Horizontal line | B. Vertical line | C. Diagonal line | D. None of these

Answer: B

188. A point that satisfies all given inequalities is called:

A. Feasible solution | B. Optimal solution | C. Boundary point | D. None of these

Answer: A

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189. The line $y = 3x + 2$ has a slope of:

A. 2 | B. 3 | C. -3 | D. -2

Answer: B

190. If the inequalities $x \geq 0$ and $y \geq 0$ are given, the solution region lies in:

A. First quadrant | B. Second quadrant | C. Third quadrant | D. Fourth quadrant

Answer: A

191. The inequality $5x - 3y < 15$ represents:

A. A parabola | B. A straight line | C. A shaded region | D. A single point

Answer: C

192. The maximum or minimum value of an objective function occurs at:

A. A random point | B. A feasible point | C. A corner point | D. An undefined point

Answer: C

193. The solution region for $x - y \leq 4$ is the half-plane:

A. Above the line | B. Below the line | C. On the line | D. None of these

Answer: A

194. The intersection of $x + y = 4$ and $x - y = 2$ is:

A. (1,3) | B. (3,1) | C. (2,2) | D. (4,0)

Answer: B

195. Which of the following is an objective function?

A. $x + y$ | B. $x^2 + y^2$ | C. $3x + 2y$ | D. Both a and c

Answer: D

196. The feasible region for an inequality system is always:

A. A single point | B. A region on the plane | C. An empty set | D. A line segment

Answer: B

197. A vertical line divides the plane into:

A. Two half-planes | B. Four quadrants | C. Three sections | D. Infinite parts

Answer: A

198. If a system of inequalities has no solution, its feasible region is:

A. Infinite | B. A single point | C. A line segment | D. Empty

Answer: D

199. In the following, a linear equation is:

A. $5x > 7$ | B. $4x - 2 < 1$ | C. $2x + 1 = 1$ | D. $4 = 1 + 3$

Answer: C

200. The solution of $5x - 10 = 10$ is:

A. 0 | B. 50 | C. 4 | D. -4

Answer: C

201. If $7x + 4 < 6x + 6$ then x belongs to the interval:

A. $(2, \infty)$ | B. $[2, \infty)$ | C. $(-\infty, 2)$ | D. $(-\infty, 2]$

Answer: C

202. A vertical line divides the plane into:

A. Left half plane | B. Right half plane | C. Full plane | D. Two half planes

Answer: D

203. The linear equation formed from a linear inequality is called:

A. Linear equation | B. Associated equation | C. Quadratic equation | D. None of these

Answer: B

204. $3x + 4 < 0$ is:

A. Equation | B. Inequality | C. Not inequality | D. Identity

Answer: B

205. A corner point is also called:

A. Code | B. Vertex | C. Curve | D. Region

Answer: B

207. The solution region restricted to the first quadrant is called:

A. Objective region | B. Feasible region | C. Solution region | D. Constraints region

Answer: B

208. A function that is to be maximized or minimized is called:

A. Solution function | B. Objective function | C. Feasible function | D. None of these

Answer: B

Chapter 6: Trigonometry

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209. In $\angle AOB$ the vertex is:

A. A | B. O | C. B | D. None of these

Answer: B

210. The ray OA is written symbolically as:

A. OA | B. $\overrightarrow{OA}$ | C. $\overleftrightarrow{OA}$ | D. $\overleftarrow{OA}$

Answer: A

211. Co-terminal angle of 65° is:

A. 360° | B. -360° | C. 425° | D. -405°

Answer: C

212. What is the measure of a full rotation in degrees?

A. 90° | B. 180° | C. 270° | D. 360°

Answer: D

213. What is the measure of a right angle in radians?

A. $\pi/2$ | B. π | C. $3\pi/2$ | D. 2π

Answer: A

214. Which of the following is an obtuse angle?

A. 45° | B. 90° | C. 120° | D. 180°

Answer: C

215. What is the measure of a straight angle in radians?

A. 2π | B. $3\pi/2$ | C. π | D. $\pi/2$

Answer: C

216. What is the measure of 1 radian in degrees?

A. 57.2958° | B. 90° | C. 180° | D. 360°

Answer: A

217. Convert 73.12° to degrees, minutes, and seconds.

A. $73^\circ 12' 12''$ | B. $73^\circ 12' 7''$ | C. $73^\circ 7' 7''$ | D. $73^\circ 7' 12''$

Answer: D

218. Convert $45^\circ 45' 45''$ to decimal degrees.

A. 45.1234 | B. 45.4567 | C. 45.7625 | D. 45.9876

Answer: C

219. What is the value of 1° in seconds?

A. 60" | B. 360" | C. 3600" | D. 60'

Answer: C

220. What is the measure of a full circle in radians?

A. 2π | B. $3\pi/2$ | C. π | D. $\pi/2$

Answer: A

221. Convert $5\pi/3$ radians to degrees.

A. 300° | B. 150° | C. 210° | D. 330°

Answer: A

222. Convert 15° to radians.

A. $\pi/12$ | B. $\pi/6$ | C. $\pi/4$ | D. $\pi/3$

Answer: A

223. Convert 1.2 radians to degrees.

A. 90° | B. 57.2958° | C. 45° | D. 68.75°

Answer: D

224. One full revolution of a circle is ... radian.

A. π | B. 2π | C. 3π | D. 4π

Answer: B

225. Area of a sector is =

A. $\frac{1}{2}r^2\theta$ | B. πr^2 | C. $4\pi r^2$ | D. $\frac{1}{2}r^3\theta$

Answer: A

226. What is the value of $\sin(\pi/4)$?

A. $\sqrt{2}$ | B. $\sqrt{3}$ | C. $1/\sqrt{2}$ | D. $1/\sqrt{3}$

Answer: C

227. How many fundamental trigonometric ratios are there?

A. 3 | B. 4 | C. 5 | D. 6

Answer: D

228. Reciprocal of $\sin\theta$ is:

A. $\sec\theta$ | B. $\csc\theta$ | C. $\cot\theta$ | D. $\tan\theta$

Answer: B

229. $\cot\theta =$

A. $1/\sin\theta$ | B. $1/\cos\theta$ | C. $1/\tan\theta$ | D. $\sqrt{1-\cos^2\theta}$

Answer: C

230. $\sin\theta =$

A. $\sqrt{1 - \cos^2\theta}$ | B. $1/\tan\theta$ | C. $\sin\theta/\cos\theta$ | D. $\sqrt{1 - \cos^2\theta}$

Answer: A

231. If $\sin\theta = 2/3$, then the value of $\csc\theta$ is:

A. $2/3$ | B. $-2/3$ | C. $3/2$ | D. $-3/2$

Answer: C

232. In right-angled triangle ABC, if $m\angle B = 90^\circ$, then which statement is true?

A. $a^2 + b^2 = c^2$ | B. $a^2 - b^2 = c^2$ | C. $a^2 + c^2 = b^2$ | D. $a^2 + b^2 = a^2$

Answer: C

233. What is the value of $\cot 30^\circ$?

A. $\sqrt{3}$ | B. $1/\sqrt{3}$ | C. 1 | D. 0

Answer: A

234. What is the value of $\sin(90^\circ - \theta)$?

A. $\tan\theta$ | B. $\sin\theta$ | C. $\cos\theta$ | D. $\cot\theta$

Answer: C

235. What is the value of $\tan\theta$ in terms of $\sin\theta$ and $\cos\theta$?

A. $\sin\theta/\cos\theta$ | B. $\cos\theta/\sin\theta$ | C. $1/\sin\theta$ | D. $1/\cos\theta$

Answer: A

236. Which of the following is a Pythagorean identity?

A. $\sin^2\theta + \cos^2\theta = 1$ | B. $\sin\theta + \cos\theta = 1$ | C. $\tan\theta + \cot\theta = 1$ | D. $\sec\theta + \csc\theta = 1$

Answer: A

237. What is the value of $1 + \tan^2\theta$?

A. $\sin^2\theta$ | B. $\csc^2\theta$ | C. $\cot^2\theta$ | D. $\sec^2\theta$

Answer: D

238. What is the value of $1 + \cot^2\theta$?

A. $\csc^2\theta$ | B. $\sec^2\theta$ | C. $\tan^2\theta$ | D. $\sin^2\theta$

Answer: A

239. If $\tan\theta = 3/4$, what is the value of $\sin\theta$?

A. $5/3$ | B. $4/5$ | C. $3/5$ | D. $5/4$

Answer: C

240. What is the value of $\sin 45^\circ$?

A. $1/\sqrt{2}$ | B. $\sqrt{3}/2$ | C. $1/2$ | D. 1

Answer: A

241. What is the value of $\cos 30^\circ$?

A. $1/2$ | B. $\sqrt{3}/2$ | C. $1/\sqrt{2}$ | D. 1

Answer: B

242. What is the value of $\tan 60^\circ$?

A. $\sqrt{3}$ | B. $1/\sqrt{3}$ | C. 1 | D. 0

Answer: A

243. What is the value of $\cot 45^\circ$?

A. 1 | B. $\sqrt{3}/2$ | C. $1/\sqrt{3}$ | D. 0

Answer: A

244. In a right-angled triangle, if one acute angle is 30° , what is the other acute angle?

A. 60° | B. 45° | C. 90° | D. 120°

Answer: A

245. In a right triangle, if one side is 2 cm and the hypotenuse is 4 cm, what is the other side?

A. 3 cm | B. $\sqrt{20}$ cm | C. $2\sqrt{3}$ cm | D. 4 cm

Answer: C

246. In a 45° - 45° - 90° triangle, what is the hypotenuse if one leg is 5 cm?

A. $5\sqrt{2}$ cm | B. 5 cm | C. 10 cm | D. $10\sqrt{2}$ cm

Answer: A

247. In a right triangle, if the legs are 3 cm and 4 cm, what is the hypotenuse?

A. 5 cm | B. 6 cm | C. 7 cm | D. 8 cm

Answer: A

248. In a right triangle, if the hypotenuse is 10 cm and one leg is 6 cm, what is the other leg?

A. 4 cm | B. 6 cm | C. 8 cm | D. 2 cm

Answer: C

250. In a right triangle, hypotenuse is 13 and $\theta = 30^\circ$. The opposite side is:

A. 6.5 units | B. 7.5 units | C. 6 units | D. 5 units

Answer: A

251. An observer 50 m away sees a building top at a 45° elevation. The building's height is:

A. 50 m | B. 25 m | C. 35 m | D. 70 m

Answer: A

Chapter 7: Coordinate Geometry

273. The slope of a line perpendicular to $x = 3$ is:

A. 0 | B. $\sqrt{1}$ | C. 2 | D. -1

Answer: A

274. The slope of the line passing through (2, 3) and (4, 7) is:

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

Answer: B

275. The inclination of a line with slope 1 is:

A. 30° | B. 45° | C. 60° | D. 90°

Answer: B

276. If the slope of a line is undefined, the line is:

A. Horizontal | B. Vertical | C. Slanted | D. Parallel to y-axis

Answer: B

277. The slope of a line parallel to the x-axis is:

A. 0 | B. 1 | C. Undefined | D. -1

Answer: A

278. The slope of a line perpendicular to a line with slope 2 is:

A. 2 | B. -2 | C. $1/2$ | D. $-1/2$

Answer: D

279. The equation of a line with slope 3 and y-intercept 2 is:

A. $y = 3x + 2$ | B. $y = 2x + 3$ | C. $y = 3x - 2$ | D. $y = 2x - 3$

Answer: A

280. The equation of a line passing through (1, 2) with slope 4 is:

A. $y = 4x - 2$ | B. $y = 4x + 2$ | C. $y = 4x - 6$ | D. $y = 4x + 6$

Answer: A

281. The equation of a line passing through (2, 3) and (4, 7) is:

A. $y = 2x - 1$ | B. $y = 2x + 1$ | C. $y = 3x - 1$ | D. $y = 3x + 1$

Answer: A

282. The equation of a line with x-intercept 3 and y-intercept 4 is:

A. $4x + 3y = 12$ | B. $3x + 4y = 12$ | C. $4x - 3y = 12$ | D. $3x - 4y = 12$

Answer: A

283. The equation of a line parallel to $y = 2x + 3$ and passing through (1, 1) is:

A. $y = 2x - 1$ | B. $y = 2x + 1$ | C. $y = 2x - 3$ | D. $y = 2x + 3$

Answer: A

284. The equation $2x + 3y = 6$ in slope-intercept form is:

A. $y = -2/3x + 2$ | B. $y = 2/3x + 2$ | C. $y = 2/3x - 2$ | D. $y = -2/3x - 2$

Answer: A

285. The equation $3x - 4y = 12$ in intercept form is:

A. $x/4 + y/3 = 1$ | B. $x/4 - y/3 = 1$ | C. $x/4 + y/3 = 1$ | D. $x/4 - y = 12$

Answer: B

286. The equation $5x - 12y + 39 = 0$ can be written as:

A. $5x - 12y = -39$ | B. $5x + 12y = 39$ | C. $5x - 12y = 39$ | D. $5x + 12y = -39$

Answer: A

287. The perimeter of a rectangle with corners at (0,0), (0,5), (8,5), and (8,0) is:

A. 40 | B. 30 | C. 36 | D. 26

Answer: D

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288. The midpoint of a journey from (40°N, 100°W) to (50°N, 80°W) is:

A. (50°N, 90°W) | B. (45°N, 80°W) | C. (45°N, 90°W) | D. (40°N, 90°W)

Answer: C

289. The distance between two towns with coordinates (3, 4) and (7, 1) is:

A. 5 | B. 6 | C. 7 | D. 8

Answer: A

290. The distance between two cities with coordinates (10, 20) and (30, 40) is:

A. $20\sqrt{2}$ | B. $30\sqrt{2}$ | C. $40\sqrt{2}$ | D. $50\sqrt{2}$

Answer: A

291. The distance between points (12, 5) and (12, -4) is:

A. 9 | B. 10 | C. 11 | D. 12

Answer: A

292. The length of side AB of a triangle with vertices A(2,3), B(5,7) and C(6,2) is:

A. 5 | B. 6 | C. 7 | D. 8

Answer: A

293. The equation of a straight line in the slope-intercept form is written as:

A. $y = m(x + c)$ | B. $y - y_1 = m(x - x_1)$ | C. $y = mx + c$ | D. $ax + by + c = 0$

Answer: C

294. The gradients of two parallel lines are:

A. Equal | B. Zero | C. Negative reciprocals | D. Undefined

Answer: A

295. If the product of the gradients of two lines is -1, then the lines are:

A. Parallel | B. Perpendicular | C. Collinear | D. Coincident

Answer: B

296. The distance between points P(1,2) and Q(4,6) is:

A. 5 | B. 6 | C. $\sqrt{13}$ | D. 4

Answer: A

297. The midpoint of a line segment with endpoints (-2,4) and (6,-2) is:

A. (4,2) | B. (2,1) | C. (1,1) | D. (0,0)

Answer: B

298. The line passing through points (1,2) and (4,5) is:

A. $y = x + 1$ | B. $y = 2x + 3$ | C. $y = 3x - 2$ | D. $y = x + 2$

Answer: A

299. The equation of a line in point-slope form is:

A. $y = m(x + c)$ | B. $y - y_1 = m(x - x_1)$ | C. $y = c + mx$ | D. $ax + by + c = 0$

Answer: B

300. $2x + 3y - 6 = 0$ in the slope-intercept form is:

A. $y = -2/3x + 2$ | B. $y = 2/3x - 2$ | C. $y = 2/3x + 1$ | D. $y = -2/3x - 2$

Answer: A

Chapter 8: Logic

301. The equation of a line in two-point form leading to a symmetric representation is:

A. $x/a + y/b = 1$ | B. $y - y_1 = m(x - x_1)$ | C. $(x-x_1)/\cos\alpha = (y-y_1)/\sin\alpha$ | D. $ax + by + c = 0$

Answer: C

302. The equation of a line in normal form is:

A. $y = mx + c$ | B. $x/a + y/b = 1$ | C. $y - y_1 = m(x - x_1)$ | D. $x \cos\alpha + y \sin\alpha = p$

Answer: D

303. A conditional is regarded as false only when:

A. Antecedent is true and consequent is false | B. Consequent is true and antecedent is false | C. Antecedent is true only | D. Consequent is false only

Answer: A

304. The contrapositive of $q \rightarrow p$ is:

A. $q \rightarrow \sim p$ | B. $\sim q \rightarrow p$ | C. $\sim p \rightarrow \sim q$ | D. $\sim q \rightarrow \sim p$

Answer: C

305. The statement "Every integer greater than 2 is a sum of two prime numbers" is a:

A. Theorem | B. Conjecture | C. Axiom | D. Postulate

Answer: B

306. The statement "A straight line can be drawn between any two points" is an:

A. Theorem | B. Conjecture | C. Axiom | D. Logic

Answer: C

307. The statement "The sum of the interior angles of a triangle is 180" is a:

A. Converse | B. Theorem | C. Axiom | D. Conditional

Answer: B

308. Which expression is often related to inductive reasoning?

A. Based on repeated experiments | B. If and only if statements | C. Proven by a theorem | D. Based on general principles

Answer: A

309. Which sentence describes deductive reasoning?

A. General conclusion from limited observations | B. Based on repeated experiments | C. Based on units of accurate information | D. Draws conclusion from well-known facts

Answer: D

Chapter 9: Similar Figures

331. $a/b + c/d = ?$

A. ac/bd | B. $(a + c)/(b + d)$ | C. $(ad + bc)/bd$ | D. $(ab + cd)/bd$

Answer: C

332. $(x - 1)^2 + (x + 1)^2 = ?$

A. $4(x^2 + 1)$ | B. $3(x^2 + 1)$ | C. $2(x^2 + 1)$ | D. $(x^2 + 1)$

Answer: C

333. A closed figure with three or more sides is called a:

A. Circle | B. Rectangle | C. Triangle | D. Polygon

Answer: D

334. ... figures have the same shape but may have different sizes.

A. Congruent | B. Similar | C. Equal | D. None of these

Answer: B

335. Which type of triangles are always similar to each other?

A. Scalene triangle | B. Acute angle triangle | C. Equilateral triangle | D. Obtuse angle triangle

Answer: C

336. The symbol used for Similarity is:

A. $=$ | B. $\sim$ | C. $\approx$ | D. $\neq$

Answer: B

337. "Triangle ABC is similar to triangle DEF" is written symbolically as:

A. $\triangle ABC = \triangle DEF$ | B. $\triangle ABC \sim \triangle DEF$ | C. $\triangle ABC > \triangle DEF$ | D. $\triangle ABC < \triangle DEF$

Answer: B

338. The area of a parallelogram is:

A. Base + altitude | B. Base $\times$ altitude | C. $1/2$ (Base $\times$ altitude) | D. Length $\times$ width

Answer: B

339. What is the condition for two polygons to be similar?

A. Angles equal, sides equal | B. Angles equal, sides proportional | C. Angles proportional, sides equal | D. Angles proportional, sides proportional

Answer: B

340. If the ratio of sides of two similar triangles is 3:4, what is the ratio of their areas?

A. 3:4 | B. 9:8 | C. 9:16 | D. 12:16

Answer: C

341. In similar triangles ABC and DEF, if AB = 6, DE = 9, AC = 8, what is DF?

A. 10 cm | B. 12 cm | C. 14 cm | D. 16 cm

Answer: B

342. If a smaller polygon has an area of 25 cm² and the side ratio to a larger one is 1:2, what is the larger area?

A. 100 cm² | B. 75 cm² | C. 50 cm² | D. 125 cm²

Answer: A

343. A smaller circle has an area of 36 π cm². If the ratio of radii to a larger circle is 2:3, what is the larger area?

A. 54 π cm² | B. 81 π cm² | C. 108 π cm² | D. 144 π cm²

Answer: B

344. If the base of a parallelogram is 8 cm and altitude is 4 cm, its area is:

A. 12 cm² | B. 48 cm² | C. 18 cm² | D. 32 cm²

Answer: D

345. What is the sum of interior angles of a hexagon?

A. 720° | B. 540° | C. 900° | D. 1080°

Answer: A

346. What is the measure of each interior angle of a regular pentagon?

A. 72° | B. 108° | C. 120° | D. 144°

Answer: B

347. What is the measure of each exterior angle of a regular octagon?

A. 30° | B. 90° | C. 60° | D. 45°

Answer: D

348. How many diagonals does a heptagon (7 sides) have?

A. 7 | B. 21 | C. 14 | D. 28

Answer: C

349. What is the sum of the exterior angles of any convex polygon?

A. 180° | B. 360° | C. 540° | D. 720°

Answer: B

350. In an equilateral triangle, what is the measure of each angle?

A. 45° | B. 60° | C. 90° | D. 120°

Answer: B

351. In an isosceles triangle, if the vertex angle is 80° , what is the measure of each base angle?

A. 50° | B. 60° | C. 70° | D. 80°

Answer: A

352. In a parallelogram, opposite sides are:

A. Equal and parallel | B. Equal but not parallel | C. Parallel but not equal | D. Neither equal nor parallel

Answer: A

353. What is the measure of each angle in a rectangle?

A. 60° | B. 120° | C. 90° | D. 180°

Answer: C

354. In a rhombus, the diagonals:

A. Are equal | B. Are unequal | C. Are parallel | D. Bisect each other at right angles

Answer: D

355. The formula for an exterior angle of a regular n-gon is:

A. $360^\circ/n$ | B. $180^\circ/n$ | C. $(n-2)\times 180^\circ/n$ | D. None of these

Answer: A

356. The formula for an interior angle of a regular n-gon is:

A. $(n-2)\times 180^\circ/n$ | B. $180^\circ/n$ | C. $360^\circ/n$ | D. None of these

Answer: A

357. If two polygons are similar then:

A. Their sides are equal | B. Their areas are equal | C. Their volumes are equal | D. Their corresponding angles are equal

Answer: D

358. The ratio of the areas of two similar polygons is:

A. Equal to the ratio of their perimeters | B. Equal to the square of the ratio of their corresponding sides | C. Equal to the cube of the ratio of their corresponding sides | D. Equal to the sum of their corresponding sides

Answer: B

359. Volumes of two similar solids are 125cm^3 and 27cm^3 . The ratio of their heights is:

A. 3:5 | B. 5:3 | C. 25:9 | D. 9:25

Answer: B

360. The exterior angle of a regular pentagon is:

A. 40° | B. 45° | C. 60° | D. 72°

Answer: D

361. Two similar parallelograms have areas 64 cm^2 and 144 cm^2 . If a side of the smaller is 8 cm, the corresponding side of the larger is:

A. 10 cm | B. 12 cm | C. 18 cm | D. 16 cm

Answer: B

362. The total number of diagonals in a nonagon (9 sides) is:

A. 18 | B. 21 | C. 25 | D. 27

Answer: D

363. Two similar spheres have radii in ratio 4:5. If the larger area is $500\pi\text{ cm}^2$, the smaller area is:

A. $256\pi\text{ cm}^2$ | B. $320\pi\text{ cm}^2$ | C. $400\pi\text{ cm}^2$ | D. $405\pi\text{ cm}^2$

Answer: B

364. A regular polygon has an exterior angle of 30° . How many diagonals does it have?

A. 54 | B. 90 | C. 72 | D. 108

Answer: A

365. In a regular hexagon, the ratio of the length of the long diagonal to the side length is:

A. $\sqrt{3}:1$ | B. $2:1$ | C. $\sqrt{3}:2$ | D. $2:3$

Answer: A

366. A regular polygon has an interior angle of 165° . How many sides does it have?

A. 15 | B. 16 | C. 20 | D. 24

Answer: D

Chapter 10: Graphs of Functions

367. What is the general form of a linear function?

A. $f(x) = mx + c$ | B. $f(x) = ax^2 + bx + c$ | C. $f(x) = ax^3 + bx^2 + cx + d$ | D. $f(x) = ke^{(ax)}$

Answer: A

368. In the linear function $y = 3x - 5$, what is the slope?

A. 5 | B. 3 | C. -3 | D. -5

Answer: B

369. What is the y-intercept of the linear function $y = -2x + 8$?

A. -2 | B. 2 | C. -8 | D. 8

Answer: D

370. The graph of $y = x^2$ represents:

A. A straight line | B. A parabola opening upwards | C. A parabola opening downwards | D. A cubic curve

Answer: B

371. In the quadratic function $y = -x^2$, the parabola opens:

A. Upwards | B. Downwards | C. Left | D. Right

Answer: B

372. The standard form of a cubic function is:

A. $y = ax^3 + bx^2 + cx + d$ | B. $y = ax^2 + bx + c$ | C. $y = ax + b$ | D. None of these

Answer: A

373. The graph of $y = 2x^3 - 3x^2 + x - 5$ passes through which point?

A. (0,-5) | B. (0,0) | C. (0,5) | D. (0,-10)

Answer: A

374. What is the general form of a reciprocal function?

A. $y = ax + b$ | B. $y = ax + b + c$ | C. $y = ax^2 + bx + c$ | D. $y = a/x$

Answer: D

375. What type of function is $y = e^x$?

A. Exponential | B. Linear | C. Quadratic | D. Cubic

Answer: A

376. The general form of a quadratic function is:

A. $y = mx + c$ | B. $y = mx + c$ | C. $y = ax^2 + bx + c$ | D. $y = ax^3 + bx^2 + cx + d$

Answer: C

377. In the function $y = x^2 + 4x + 4$, what is the value of y when $x = -2$?

A. 0 | B. 4 | C. -4 | D. 8

Answer: A

378. For the function $y = x^2 + 2x + 1$, what is the vertex of the parabola?

A. (0,0) | B. (-1,0) | C. (-1,1) | D. (1,1)

Answer: B

379. The graph of $y = x^2 + 5$ intersects the y-axis at:

A. (0,5) | B. (5,0) | C. (-5,0) | D. (1,0)

Answer: A

380. The function $y = 3x^2$ represents:

A. A line | B. A parabola opening upwards | C. A parabola opening downwards | D. A cubic function

Answer: B

381. The function $y = -3x^2$ represents:

A. A line | B. A parabola opening upwards | C. A parabola opening downwards | D. A cubic function

Answer: C

382. What does the graph of $y = x^3$ look like?

A. A straight line | B. A parabola | C. A cubic curve through the origin | D. A hyperbola

Answer: C

383. The graph of the function $y = 5x$ represents:

A. Exponential growth | B. Exponential decay | C. A line passing through the origin | D. A hyperbola

Answer: C

384. For the quadratic function $y = x^2 + 2x - 2$, what is the vertex?

A. (-1, -3) | B. (0, 3) | C. (1, 2) | D. (-2, 1)

Answer: A

385. The graph of $y = -x^2 + 4$ cuts the y-axis at:

A. (0, 4) | B. (0, -4) | C. (4, 0) | D. (-4, 0)

Answer: A

386. What is the slope of the line $y = 2x + 3$?

A. 2 | B. 3 | C. -2 | D. 0

Answer: A

387. What is the slope of the line $y = -3x + 2$?

A. 3 | B. -3 | C. 2 | D. -2

Answer: B

388. The equation $y = 3x$ represents which type of graph?

A. A line with slope 3 | B. A parabola | C. A cubic curve | D. Exponential decay

Answer: A

389. The gradient of the tangent to the curve $y = 2x^2 - 3x + 1$ at $x = 1$ is:

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

Answer: A

390. The graph of $y = -2x^2 + 4x - 3$ is a:

A. Parabola opening downwards | B. Parabola opening upwards | C. Line | D. Exponential growth

Answer: A

391. In a reciprocal function $y = 1/x$, as x approaches zero, what happens to y ?

A. It approaches infinity | B. It approaches zero | C. It becomes undefined | D. It remains constant

Answer: A

392. In the equation $y = 5x - 2$, what is the y-intercept?

A. -5 | B. -2 | C. 2 | D. 5

Answer: B

393. What is the break-even point for $C(x) = 1200 + 20x$ and $R(x) = 50x$?

A. 40 | B. 50 | C. 60 | D. 75

Answer: A

394. In the function $y = x^3 + 3x^2$, what is the slope of the tangent at $x = 0$?

A. 0 | B. 3 | C. 6 | D. -3

Answer: A

395. The function $y = 3x^2 + 2x - 1$ has its minimum value at:

A. $x = 0$ | B. $x = -1$ | C. $x = -1/3$ | D. $x = 2$

Answer: C

396. In the function $y = x^2 + 4x$, what is the axis of symmetry?

A. $x = 0$ | B. $x = -2$ | C. $x = 2$ | D. $x = -4$

Answer: B

397. What is the domain of the reciprocal function $y = 1/x$?

A. All real numbers except zero | B. All real numbers | C. Positive real numbers | D. Negative real numbers

Answer: A

398. The graph of $y = 2x^3 - x^2 - 5$ is:

A. Linear | B. Quadratic | C. Cubic | D. Exponential

Answer: C

399. For the function $y = 3x - 4$, the graph is a:

A. Line | B. Parabola | C. Hyperbola | D. Exponential function

Answer: A

400. The graph of $y = x^3$ passes through the point:

A. (0,0) | B. (1,0) | C. (0,1) | D. (0,-1)

Answer: A

424. $y = 5x$ is a(n) ... function:

A. Linear | B. Quadratic | C. Cubic | D. Exponential

Answer: A

425. Which is a reciprocal function?

A. $y = 7x$ | B. $y = 2/x$ | C. $y = 2x^2$ | D. $y = 5x^3$

Answer: B

426. $y = -3x^2 + 7$ is a ... function:

A. Exponential | B. Cubic | C. Linear | D. Reciprocal

Answer: C

Chapter 11: Loci and Construction

427. The intersection of the three angle bisectors of a triangle is the:

A. Orthocenter | B. Centroid | C. Circumcenter | D. Incenter

Answer: D

428. An equilateral triangle is always a(n) ... triangle.

A. Obtuse | B. Right | C. Acute | D. None of these

Answer: C

429. The center of a circle passing through all vertices of a triangle is the:

A. Incenter | B. Circumcenter | C. Centroid | D. Orthocenter

Answer: B

430. The point of intersection of the perpendicular bisectors of the sides of a triangle is the:

A. Incenter | B. Centroid | C. Circumcenter | D. Orthocenter

Answer: C

431. A triangle with one angle greater than 90° is a(n):

A. Acute triangle | B. Right-angled triangle | C. Obtuse triangle | D. Isosceles triangle

Answer: C

432. The point where all the medians of a triangle meet is the:

A. Circumcenter | B. Incenter | C. Centroid | D. Orthocenter

Answer: C

433. The locus of points at a fixed distance from a given point is a:

A. Perpendicular bisector | B. Circle | C. Angle bisector | D. Line segment

Answer: B

434. What is the angle bisector of a triangle?

A. A line that divides an angle into two equal parts | B. A line passing through a vertex | C. A line joining midpoints of sides | D. A line perpendicular to a side

Answer: A

435. The orthocenter of a triangle is where the ... meet.

A. Circumcenter and centroid | B. Altitudes | C. Perpendicular bisectors | D. Medians

Answer: B

436. How many types of triangles are there with respect to angles?

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

Answer: B

437. A triangle with all sides and angles equal is:

A. Right triangle | B. Isosceles triangle | C. Equilateral triangle | D. Scalene triangle

Answer: C

438. The centroid of a triangle is the point of concurrency of the:

A. Angle bisectors | B. Altitudes | C. Perpendicular bisectors | D. Medians

Answer: D

439. In a right-angled triangle, the side opposite the right angle is the:

A. Hypotenuse | B. Median | C. Altitude | D. Base

Answer: A

440. Which is true for an equilateral triangle?

A. It has one angle of 90° | B. All angles are 60° | C. It has two equal sides | D. The sides are all different

Answer: B

441. What is the sum of the interior angles of any triangle?

A. 180° | B. 360° | C. 90° | D. 120°

Answer: A

442. A triangle with two equal sides is called a(n):

A. Equilateral triangle | B. Scalene triangle | C. Isosceles triangle | D. Right triangle

Answer: C

443. How many types of triangles are there with respect to sides?

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

Answer: B

444. The centroid divides each median in a ratio of:

A. 1:2 | B. 2:1 | C. 1:3 | D. 3:1

Answer: B

445. Which is not a type of triangle based on sides?

A. Scalene | B. Isosceles | C. Equilateral | D. Acute Angle

Answer: D

446. A perpendicular from a vertex to the opposite side is the:

A. Altitude | B. Median | C. Bisector | D. Angle

Answer: A

447. A triangle with one angle equal to 90° is a:

A. Scalene triangle | B. Equilateral triangle | C. Right-angled triangle | D. Isosceles triangle

Answer: C

448. A triangle is a closed figure having ... sides.

A. Two | B. Three | C. Four | D. Five

Answer: B

449. Which criterion requires two sides and the included angle?

A. SAS criterion | B. ASA criterion | C. SSS criterion | D. AAS criterion

Answer: A

450. The angle formed by two sides at a vertex of a triangle is a(n):

A. Complementary angle | B. Opposite angle | C. Interior angle | D. Exterior angle

Answer: C

451. A triangle can be constructed if the sum of any two sides is ... the third side.

A. Less than | B. Greater than | C. Equal to | D. Greater than and equal to

Answer: B

452. An equilateral triangle...

A. Can be isosceles | B. Can be right-angled | C. Can be obtuse-angled | D. Has each angle equal to 50°

Answer: A

453. If the sum of two angles in a triangle is less than 90° , the triangle is:

A. Equilateral | B. Acute-angled | C. Obtuse-angled | D. Right-angled

Answer: C

454. The line segment joining a vertex to the midpoint of the opposite side is a:

A. Median | B. Perpendicular bisector | C. Angle bisector | D. Altitude

Answer: A

455. The angle bisectors of a triangle intersect at:

A. One point | B. Two points | C. Three points | D. Four points

Answer: A

456. The locus of all points equidistant from a fixed point is a...

A. Circle | B. Perpendicular bisector | C. Angle bisector | D. Parallel lines

Answer: A

457. The locus of points equidistant from two fixed points is the...

A. Circle | B. Perpendicular bisector | C. Angle bisector | D. Parallel lines

Answer: B

458. The locus of points equidistant from a fixed line is/are...

A. Circle | B. Perpendicular bisector | C. Angle bisector | D. Parallel lines

Answer: D

459. The locus of points equidistant from two intersecting lines is the...

A. Circle | B. Perpendicular bisector | C. Angle bisector | D. Parallel lines

Answer: C

460. The set of points farther than 2 km from point B is the region outside a circle of radius...

A. 1 km | B. 1.9 km | C. 2 km | D. 2.1 km

Answer: C

Chapter 12: Information Handling

461. The tally mark for a frequency of 10 is:

A. |||| | |||| | B. |||| | |||| | C. |||| | |||| | D. |||| | |||| |

Answer: A

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462. The class boundaries of the class 5-9 are:

A. 5.5 - 10.5 | B. 4.5 - 8.5 | C. 4.5 - 9.5 | D. 4 - 10

Answer: C

463. The process of collecting, organizing, analyzing, and interpreting data is called:

A. Data Collection | B. Information Handling | C. Data Analysis | D. Data Interpretation

Answer: B

464. Which of the following is an example of discrete data?

A. Height of students | B. Weight of students | C. Number of books sold | D. Temperature of a city

Answer: C

465. What is the term for data that can take any value in a given interval?

A. Discrete data | B. Continuous data | C. Grouped data | D. Ungrouped data

Answer: B

466. Which is an example of ungrouped data?

A. Marks in classes | B. Number of toys sold | C. A list of student heights | D. Daily temperatures in a table

Answer: C

467. What is the term for data arranged in groups or classes?

A. Ungrouped data | B. Grouped data | C. Discrete data | D. Continuous data

Answer: B

468. Who is known as the "father of modern statistics"?

A. Newton | B. Henry | C. Sir Ronald Fisher | D. Arthur Cayley

Answer: C

469. The formula to calculate the size of a class interval is:

A. Size = Range / No. of classes | B. Size = Range $\times$ No. of classes | C. Size = Range + No. of classes | D. Size = Range - No. of classes

Answer: A

470. What is the range if the greatest value is 136 and the smallest is 30?

A. 106 | B. 166 | C. 96 | D. 136

Answer: A

471. The difference between the upper and lower class limits is the:

A. Class size | B. Class boundary | C. Class interval | D. Class frequency

Answer: A

472. In the class 10-14, the lower class limit is:

A. 9.5 | B. 10 | C. 12 | D. 14

Answer: B

473. What is a histogram?

A. A graph of pie charts | B. A graph of connected lines | C. A graph of adjacent rectangles | D. A graph of separate bar charts

Answer: C

474. The midpoint of a class interval is called the:

A. Class boundary | B. Class mark | C. Class limit | D. Class frequency

Answer: B

475. The formula for the midpoint of a class interval is:

A. (Lower limit + Upper limit)/2 | B. (Upper limit - Lower limit)/2 | C. Lower limit $\times$ Upper limit | D. None of these

Answer: A

476. The mode of the first 20 whole numbers (0-19) is:

A. 0 | B. 20 | C. 19 | D. No Mode

Answer: D

477. The formula for the arithmetic mean is:

A. Mean = $\Sigma x / n$ | B. Mean = Sum $\times$ Number | C. Mean = Sum - Number | D. Mean = Sum + Number

Answer: A

478. What is the median of the data set: 5, 8, 12, 13, 16, 18, 20?

A. 12 | B. 13 | C. 16 | D. 18

Answer: B

479. What is the mode of the data set: 10, 15, 15, 20, 20, 20, 25?

A. 15 | B. 20 | C. 25 | D. No mode

Answer: B

480. What is the term for the most frequently occurring value in a data set?

A. Mean | B. Median | C. Mode | D. Range

Answer: C

481. The formula for the weighted mean is:

A. Weighted Mean = $\Sigma(wx)/\Sigma w$ | B. Weighted Mean = $\Sigma(wx) \times \Sigma w$ | C. Weighted Mean = $\Sigma(wx) - \Sigma w$ | D. Weighted Mean = $\Sigma(wx) + \Sigma w$

Answer: A

482. What is the weighted mean for values 74, 78, 74, 90 with weights 4, 3, 5, 6?

A. 80 | B. 85 | C. 90 | D. 95

Answer: A

483. What is the average where different observations have different weights?

A. Arithmetic mean | B. Weighted mean | C. Median | D. Mode

Answer: B

484. What is the average of 114 packets distributed to 7 areas? (approx.)

A. 16 | B. 17 | C. 18 | D. 19

Answer: A

485. What is the average budget for years with budgets 5, 7, 8, 6, 7 million?

A. 6.6 | B. 7.0 | C. 7.5 | D. 8.0

Answer: A

486. Arithmetic mean is denoted by:

A. $\bar{X}$ | B. X | C. X | D. SD

Answer: A

487. What is the average of the marks: 84, 91, 72, 68, 87, 78?

A. 80 | B. 82 | C. 84 | D. 86

Answer: A

488. The symbol used for summation is:

A. = | B. Σ | C. % | D. ~

Answer: B

489. What is the median of: 55, 53, 54, 58, 60, 61, 62, 56, 57, 51, 63?

A. 56 | B. 57 | C. 58 | D. 59

Answer: B

490. The formula for the arithmetic mean of ungrouped data is:

A. $\Sigma x/n$ | B. $(n+1)/2$ th term | C. Both a and b | D. None of these

Answer: A

491. What is the median of: 110, 125, 122, 130, 124, 127, 120?

A. 124 | B. 125 | C. 126 | D. 127

Answer: A

492. What is the mode of: 88, 70, 72, 125, 95, 81, 90, 95, 90?

A. 90 | B. 95 | C. 90 and 95 | D. No mode

Answer: C

493. The symbol $\bar{X}$ is used for:

A. Mode | B. Median | C. Range | D. Arithmetic mean

Answer: B

494. What is the mean of: 4, 6, 10, 12, 15, 20, 25, 28, 30?

A. 16.67 | B. 18.00 | C. 20.00 | D. 22.00

Answer: A

495. What is the mean of: 12, 18, 19, 0, -19, -18, -12?

A. 0 | B. 1 | C. 2 | D. 3

Answer: A

496. The formula $l + (fm-f_1)/(fm-f_2) \times h$ is used for:

A. Mode | B. Median | C. Range | D. Arithmetic mean

Answer: A

497. Which data type takes only specific values?

A. Continuous data | B. Discrete data | C. Grouped data | D. Ungrouped data

Answer: B

498. The number of times a value occurs in data is called:

A. Frequency | B. Relative frequency | C. Class limit | D. Class boundaries

Answer: A

499. Midpoint is also known as:

A. Mean | B. Median | C. Class limit | D. Class mark

Answer: D

500. A frequency polygon is constructed by using a:

A. Histogram | B. Bar graph | C. Class boundaries | D. Class limit

Answer: A

501. The difference between the greatest and smallest values is the:

A. Class limit | B. Midpoint | C. Relative frequency | D. Range

Answer: D

502. Measure of central tendency is used to find the ... of a data set.

A. Class boundaries | B. Cumulative frequency | C. Middle or center value | D. Frequency

Answer: C

503. If the mean of 5, 7, 8, 9, and x is 7.5, what is x?

A. 10 | B. 8 | C. 8.5 | D. 5.8

Answer: C

504. Find the mode of the data: 2, 5, 8, 9, 0, 1, 3, 7, and 10.

A. 5 | B. 7 | C. 0 | D. No mode

Answer: D

505. The value that appears most often in a data set is the:

A. Mean | B. Mode | C. Median | D. Weighted mean

Answer: B

506. Find the median of: 110, 125, 122, 130, 124, 120.

A. 123 | B. 120 | C. 125 | D. 127

Answer: A

507. Mode of data 80, 80, 82, 82, 82, 85 is:

A. 80 | B. 82 | C. 85 | D. 0

Answer: B

Chapter 13: Probability

508. What is the formula to calculate probability?

A. $P(A) = n(A)/n(S)$ | B. $P(A) = n(S)/n(A)$ | C. $P(A) = n(A) \times n(S)$ | D. $P(A) = n(S) - n(A)$

Answer: A

509. Which of the following is not a statistical experiment?

A. Tossing a coin | B. Rolling a die | C. Guessing a number | D. Drawing a card from a deck

Answer: C

510. What is the probability of getting a head when tossing a fair coin?

A. $1/2$ | B. $1/3$ | C. $1/4$ | D. $1/6$

Answer: A

511. If a fair die is rolled, what is the probability of getting a number divisible by 3?

A. $1/6$ | B. $1/4$ | C. $1/3$ | D. $1/2$

Answer: C

512. What is the sample space when a single coin is tossed?

A. {A, B} | B. {1, 2, 3} | C. {1, 2, 3, 4} | D. {H, T}

Answer: D

513. If a die is rolled twice, what is the total number of possible outcomes?

A. 6 | B. 36 | C. 12 | D. 24

Answer: B

514. If an event has 3 favorable outcomes and the sample space is 6, what is the probability?

A. $1/6$ | B. $1/4$ | C. $1/3$ | D. $1/2$

Answer: D

515. The complement of event A is denoted by:

A. $P(S)$ | B. $P(A)$ | C. $P(A')$ | D. $P(A \text{ and } B)$

Answer: C

516. What is the probability of not getting a 6 on a fair die?

A. $1/6$ | B. $5/6$ | C. $1/3$ | D. $2/3$

Answer: B

517. If a fair die is rolled, what is the probability of getting an even number?

A. $1/2$ | B. $1/3$ | C. $1/4$ | D. $1/6$

Answer: A

518. When rolling two dice, what is the probability of getting a sum of 8?

A. $1/9$ | B. $5/36$ | C. $1/36$ | D. $1/12$

Answer: B

519. What is the probability of getting a double six when rolling two dice?

A. $\frac{1}{36}$ | B. $\frac{1}{18}$ | C. $\frac{1}{12}$ | D. $\frac{1}{6}$

Answer: A

520. The probability of an event is always:

A. Less than 0 | B. Greater than 1 | C. Equal to 1 | D. Between 0 and 1 (inclusive)

Answer: D

521. Probability of selecting a blue ball from a bag of 5 blue and 8 green balls is:

A. $\frac{5}{13}$ | B. $\frac{8}{13}$ | C. $\frac{1}{3}$ | D. $\frac{5}{8}$

Answer: A

522. Probability of getting neither a spade nor a heart from a deck of 52 cards is:

A. $\frac{26}{52}$ | B. $\frac{26}{39}$ | C. $\frac{1}{2}$ | D. $\frac{1}{4}$

Answer: C

523. If the probability of an event is 0.3, the probability of its complement is:

A. 0.4 | B. 0.5 | C. 0.3 | D. 0.7

Answer: D

524. What is the probability of drawing a heart from a deck of 52 cards?

A. $\frac{1}{13}$ | B. $\frac{1}{4}$ | C. $\frac{1}{2}$ | D. $\frac{1}{26}$

Answer: B

525. Probability of not getting a red ball from a bag with 8 red and 5 blue balls is:

A. $\frac{5}{13}$ | B. $\frac{8}{13}$ | C. $\frac{5}{8}$ | D. $\frac{8}{5}$

Answer: A

526. When rolling two dice, what is the probability of getting a sum of 6?

A. $\frac{1}{36}$ | B. $\frac{3}{36}$ | C. $\frac{1}{6}$ | D. $\frac{5}{36}$

Answer: D

527. The probability of getting an even sum when rolling two dice is:

A. $\frac{5}{36}$ | B. $\frac{18}{36}$ | C. $\frac{9}{36}$ | D. $\frac{12}{36}$

Answer: B

528. The probability of drawing a red card from a deck of 52 cards is:

A. $\frac{1}{2}$ | B. $\frac{13}{52}$ | C. $\frac{26}{52}$ | D. $\frac{1}{26}$

Answer: A

529. Probability of drawing a white ball from a bag with 5 white and 7 black balls is:

A. $\frac{1}{3}$ | B. $\frac{7}{12}$ | C. $\frac{1}{2}$ | D. $\frac{5}{12}$

Answer: D

530. If a probability is $\frac{1}{5}$, the expected frequency in 100 trials is:

A. 20 | B. 50 | C. 10 | D. 25

Answer: A

531. The relative frequency is:

A. Frequency/Total Trials | B. Frequency/Total Trials | C. Frequency/Total Trials | D. Frequency/Total Trials

Answer: A

532. The relative frequency is:

A. Total favorable / Total possible | B. How often an event occurs / # of trials | C. The number of trials | D. How often an event occurs

Answer: B

533. The relative frequency is:

A. Frequency/Total Trials | B. Frequency/Total Trials | C. Frequency/Total Trials | D. Frequency/Total Trials

Answer: A

534. The expected frequency of an event A in N trials is given by:

A. $NP(B)$ | B. $NP(A)$ | C. $NP(X)$ | D. None of these

Answer: B

535. Each element of the sample space is called a:

A. Event | B. Experiment | C. Sample point | D. Outcome

Answer: C

536. The number of times we expect an event to happen is the:

A. Outcomes | B. Favourable outcome | C. Expected Frequency | D. Sample point

Answer: C

537. What tells us how often an event occurs relative to the total number of trials?

A. Expected frequency | B. Sum of relative frequency | C. Relative frequency | D. Frequency

Answer: C

538. The estimated probability of an event occurring is also known as:

A. Relative frequency | B. Expected frequency | C. Class boundaries | D. Sum of expected frequency

Answer: A

539. The sum of all expected frequencies is equal to the number of:

A. Trials | B. Relative frequencies | C. Outcomes | D. Events

Answer: A

540. The chance of occurrence of a particular event is called:

A. Sample space | B. Estimated probability | C. Probability | D. Expected frequency

Answer: C

541. An event that has a greater chance to occur is called a:

A. Equally likely event | B. Likely event | C. Unlikely event | D. Certain event

Answer: B

542. The total number of outcomes when 4 dice are rolled is:

A. 6 | B. 36 | C. 1296 | D. 6^4

Answer: C

543. When rolling a pair of dice, what is the probability of a double 2?

A. $1/6$ | B. $1/3$ | C. $5/6$ | D. $1/36$

Answer: D

544. What is the probability of drawing a card that is not a jack and not a king?

A. $2/13$ | B. $11/13$ | C. $2/52$ | D. $11/52$

Answer: B

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