

Preparing for College Entrance Exams

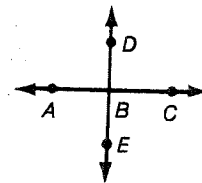
Chapter 1

Directions: Write the letter of the best answer in the space provided.

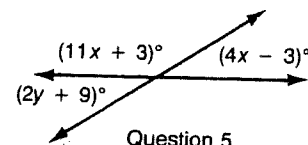
- Points $A, B, C,$ and D are coplanar. $A, B,$ and C are collinear but $B, C,$ and D are not. How many different lines are determined by points $A, B, C,$ and D ?
 (A) 3 (B) 4 (C) infinitely many
 (D) cannot be determined from the information given
- j and k are intersecting lines. A and B are points on $j,$ and C and D are points on $k.$ How many planes contain points $A, B, C,$ and D ?
 (A) none (B) exactly one (C) infinitely many
 (D) cannot be determined from the information given
- Points $M, A, T, H,$ and P are arranged on a line so that T is the midpoint of $\overline{HM},$ M is the midpoint of $\overline{HA},$ and P is the midpoint of $\overline{AT}.$ Which of the following are true?
 I. P is on $\overline{MA}.$ II. M is on $\overline{TH}.$ III. $PH = TA$
 (A) I only (B) II only (C) III only
 (D) I and II only (E) I, II, and III
- In the figure, $AC = 24, AB = 6x - 6, BC = 5x - 3,$ and $BE = 3x + 2.$ Which do you know is true?
 I. \overline{AC} bisects $\overline{DE}.$
 II. \overline{DE} bisects $\overline{AC}.$
 III. \overline{DE} bisects $\overline{AC}.$
 (A) I only (B) II only (C) III only
 (D) I and II only (E) II and III only
- Find the values of x and $y.$ (The figure is not drawn to scale.)
 (A) $x = 20, y = 34$ (B) $x = 10, y = 52$
 (C) $x = 12, y = 18$ (D) $x = 11, y = 7$
- Point A lies in plane $K,$ but point B does not. A line l through B intersects K at point $C.$ Which of the following must be true?
 I. $A, B,$ and C are coplanar.
 II. The midpoint of \overline{AB} lies in plane $K.$
 III. The midpoint of \overline{AC} lies in plane $K.$
 (A) I only (B) II only (C) III only
 (D) I and II only (E) I and III only
- In the figure, \overline{BD} bisects $\angle ABE, \overline{BE}$ bisects $\angle ABG,$ $m\angle EBF = 37,$ and $m\angle CBG = 44.$ Find $m\angle DBF.$ (The figure is not drawn to scale.)
 (A) 68 (B) 34 (C) 82 (D) 71

Answers

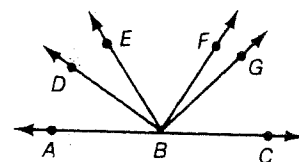
- _____
- _____
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- _____



Question 4



Question 5



Question 7

1. B 2. B 3. A 4. B 5. C 6. E 7. D

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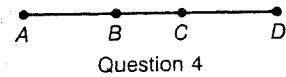
Chapter 2

Directions: Write the letter of the best answer in the space provided.

- Which of the following statements is equivalent to the statement "p implies q"?
 (A) p if and only if q. (B) If p, then q. (C) q only if p.
 (D) p if q. (E) none of these
- If $4x = 9 - \frac{1}{2}x$, which of the following must be true?
 I. $4x - 9 = \frac{1}{2}x$
 II. $4x - \frac{1}{2}x = 9$
 III. $8x = 18 - x$
 IV. $\frac{1}{2}x = 9 - 4x$
 (A) I only (B) II only (C) III only
 (D) II and III only (E) III and IV only
- The measure of the supplement of an angle is 14 less than 3 times the measure of the complement. Find the measure of the complement.
 (A) 38 (B) 52 (C) 142 (D) 19 (E) none of these
- Which of the following must be known to be true to prove that $BC < CD$?
 I. $AB = CD$
 II. $BC < AB$
 III. $AB + BC + CD = AD$
 (A) I only (B) II only (C) I and II only
 (D) II and III only (E) I, II, and III
- $\angle ABC$ and $\angle CBD$ are adjacent congruent angles, and $m\angle ABD = 160$. What are the two possible measures for $\angle ABC$?
 (A) 80, 160 (B) 100, 160 (C) 80, 100
 (D) 90, 180 (E) 160, 200
- If $abc = 3$ and $a = b$, then c equals which of the following?
 (A) $\frac{3}{a^2}$ (B) $3 - a^2$ (C) $3 - 2a$
 (D) $3 + 2a$ (E) $\frac{3}{2a}$

Answers

- _____
- _____
- _____
- _____
- _____
- _____



1. B 2. E 3. B 4. C 5. C 6. A

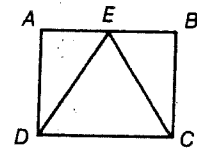
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Chapter 3

Directions: Write the letter of the best answer in the space provided.

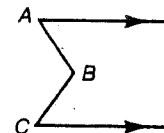
Answers	
1.	_____
2.	_____
3.	_____
4.	_____
5.	_____
6.	_____
7.	_____
8.	_____

- Use inductive reasoning to determine a formula for the number of regions into which a circle is divided by n diameters.
 (A) $n + 1$ (B) 2^n (C) $2n + 2$ (D) $2n$
- A and B are regular polygons and A has 2 more sides than B . The measure of each interior angle of A is 6 greater than the measure of the interior angle of B . How many sides does A have?
 (A) 6 (B) 8 (C) 10 (D) 12
- Planes K and J are parallel. Line p lies in plane K and line q lies in plane J . Which of the following statements must be true?
 (A) p and q are always parallel. (B) p and q are sometimes parallel.
 (C) p and q are never parallel. (D) p and q are always coplanar.
 (E) p and q sometimes intersect.
- $\overline{AD} \perp \overline{DC}$, $\overline{AB} \parallel \overline{DC}$, \overline{DE} bisects $\angle ADC$, and $m\angle ECB = 40$. Find $m\angle DEC$. (The figure is not drawn to scale.)
 (A) 90 (B) 95 (C) 85
 (D) cannot be determined from the information given



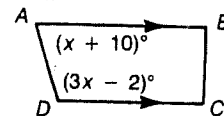
Question 4

- Find $m\angle ABC$ if $m\angle A = 48$ and $m\angle C = 46$. (The figure is not drawn to scale.)
 (A) 94 (B) 86 (C) 84
 (D) cannot be determined from the information given



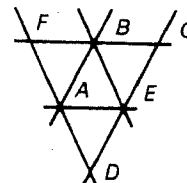
Question 5

- Find $m\angle ADC$. (The figure is not drawn to scale.)
 (A) 53 (B) 43 (C) 137 (D) 127



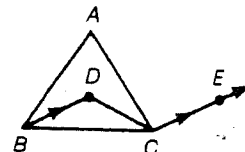
Question 6

- In the figure, $m\angle ABE = m\angle EDF = m\angle BEC$. Which of the following pairs of lines must be parallel?
 I. \overleftrightarrow{AB} and \overleftrightarrow{CD} II. \overleftrightarrow{BE} and \overleftrightarrow{DF} III. \overleftrightarrow{AE} and \overleftrightarrow{CF}
 (A) I only (B) II only (C) III only
 (D) I and II only (E) I and III only



Question 7

- In $\triangle ABC$, \overline{BD} and \overline{CD} are angle bisectors, and $\overline{CE} \parallel \overline{BD}$. If $m\angle BAC = 70$, what is $m\angle DCE$?
 (A) 70 (B) 105 (C) 125 (D) 153.5



Question 8

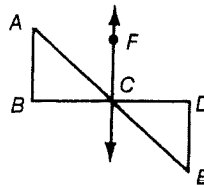
1. D 2. D 3. B 4. D 5. A 6. D 7. D 8. C

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Chapter 4

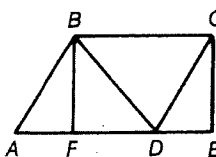
Directions: Write the letter of the best answer in the space provided.

1. $\overline{AB} \perp \overline{BD}$, $\overline{AB} \parallel \overline{DE}$, \overline{CF} bisects \overline{AE} and \overline{BD} , and $AB = DE$. What can you conclude?
 (A) $\triangle ABC \cong \triangle DEC$ (B) $\triangle ABC \cong \triangle EDC$
 (C) $\triangle ABC \cong \triangle CDE$ (D) none of these



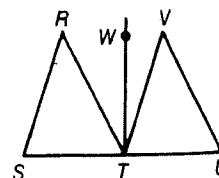
Question 1

2. $\overline{AB} \parallel \overline{CD}$, $AB = CD$, and $AF = FD = DE$. What can you conclude? (Figure is not drawn to scale.)
 I. $\triangle ABF \cong \triangle DCE$
 II. $\triangle ABF \cong \triangle DBF$
 III. $\triangle DBF \cong \triangle DCE$
 (A) I only (B) II only
 (C) III only (D) I, II, and III

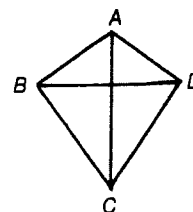


Question 2

3. $\overline{SR} \parallel \overline{TV}$, $\overline{TR} \cong \overline{UV}$, and \overline{TW} bisects both \overline{SU} and $\angle RTV$. What can you conclude?
 (A) The SAS Postulate can be used to prove that $\triangle RST \cong \triangle VTU$.
 (B) The ASA Postulate can be used to prove that $\triangle RST \cong \triangle VTU$.
 (C) The SSS Postulate can be used to prove that $\triangle RST \cong \triangle VTU$.
 (D) There is not sufficient information to prove that $\triangle RST \cong \triangle VTU$.
4. \overline{AC} bisects $\angle BAD$, $\overline{AB} \perp \overline{BC}$, and $\overline{AD} \perp \overline{CD}$. The given information is sufficient to prove which of the following?
 I. $\overline{AC} \perp \overline{BD}$
 II. \overline{AC} bisects \overline{BD} .
 III. $\overline{AB} \parallel \overline{CD}$
 (A) I only (B) II only (C) III only
 (D) I and II only (E) II and III only

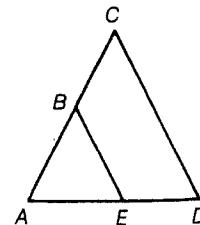


Question 3



Question 4

5. $P, Q,$ and R are collinear points with $PQ = QR$. Point S is equidistant from \overline{QP} and \overline{QR} . Which of the following must be true?
 I. $\triangle PQS \cong \triangle RQS$
 II. S lies on the perpendicular bisector of \overline{PR} .
 III. S is equidistant from P and R .
 (A) I only (B) II only (C) I and II only
 (D) I and III only (E) I, II, and III
6. $BA = BE$, $\overline{BE} \parallel \overline{CD}$, and $m\angle ACD = 56$. Find $m\angle ADC$.
 (A) 56 (B) 62 (C) 68 (D) 124
 (E) cannot be determined from the information given



Question 6

Answers

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

1. B 2. A 3. D 4. D 5. E 6. B

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Chapter 6

Directions: Write the letter of the best answer in the space provided.

- For which of the following statements are the statement, its contrapositive, its converse, and its inverse all true?
 - If $a > 1$, then $a^2 > a$.
 - Vertical angles are congruent.
 - If two lines form congruent adjacent angles, then the lines are perpendicular.

(A) I only (B) II only (C) III only
 (D) I and III only (E) I, II, and III
- In $\triangle ABC$, $AB = 7$ and $BC = 10$. AC cannot equal:

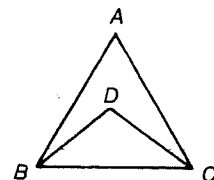
(A) 7 (B) 10 (C) 3.14 (D) 17 (E) $\frac{34}{3}$
- In $\triangle ABC$, $m\angle A = 60$ and $m\angle DBC = 31$. \overline{BD} bisects $\angle ABC$ and \overline{CD} bisects $\angle ACB$. Which side of $\triangle ABC$ is the longest? (The figure is not drawn to scale.)

(A) \overline{BD} (B) \overline{DC} (C) \overline{AC}
 (D) cannot be determined from the information given
- Based on the information in the diagram at the right, which of the following is true? (The figure is not drawn to scale.)

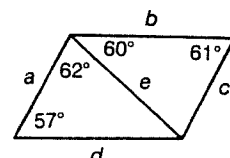
(A) $d > a > e > c > b$ (B) $d > e > c > b > a$
 (C) $e > a > b > c > d$ (D) $d > a > e > b > c$

Answers

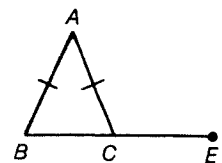
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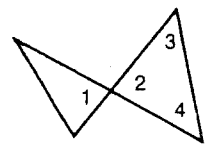
Question 3



Question 4



Questions 5, 6



$m\angle 3 > m\angle 4$

Question 7

Questions 5–7 each consist of two quantities, one in Column A and one in Column B. Figures may not be drawn to scale. Compare the two quantities and in the answer blank write:

- (A) if the quantity in Column A is greater.
 (B) if the quantity in Column B is greater.
 (C) if the two quantities are equal.
 (D) if the relationship cannot be determined from the information given.

Column A

Column B

- | | | |
|----|-------------------------|-------------------------|
| 5. | $m\angle ACE$ | $m\angle BAC$ |
| 6. | $m\angle ABC$ | $m\angle ACB$ |
| 7. | $m\angle 1 + m\angle 4$ | $m\angle 2 + m\angle 3$ |

1. C 2. D 3. C 4. A 5. A 6. C 7. B

Preparing for College Entrance Exams

Chapter 13

Directions: Write the letter of the best answer in the space provided.

1. Which of the following best describes the triangle with vertices $R(-2, -2)$, $S(2, 2)$, and $T(2, -6)$?
 (A) scalene (B) right scalene (C) isosceles
 (D) right isosceles (E) equilateral
2. Identify an equation of the circle that has as a diameter the segment joining $(9, -1)$ and $(1, 5)$.
 (A) $(x - 2)^2 + (y - 5)^2 = 85$ (B) $(x - 5)^2 + (y - 2)^2 = 25$
 (C) $(x - 2)^2 + (y - 5)^2 = 25$ (D) $(x - 5)^2 + (y - 2)^2 = 100$
3. The line that passes through points $(4, 7)$ and $(1, 1)$:
 I. has slope $\frac{1}{2}$.
 II. is perpendicular to the line through $(5, 2)$ and $(1, 4)$.
 III. is parallel to the line through $(-1, 1)$ and $(0, 3)$.
 (A) I only (B) II only (C) III only
 (D) I and II only (E) II and III only
4. Suppose you are asked to give a coordinate-geometry proof concerning an equilateral triangle. Which set of labels would you use for the vertices?
 (A) $(-a, 0)$, $(a, 0)$, $(0, a)$ (B) $(0, 0)$, $(a, 0)$, $(\frac{a}{2}, a)$
 (C) $(-a, 0)$, $(a, 0)$, $(0, b)$ (D) $(-a, 0)$, $(b, 0)$, $(\frac{-a+b}{2}, c)$
5. For what value of k will the lines $2x + ky = 6$ and $14x - 4y = k + 3$ be perpendicular?
 (A) $\frac{4}{7}$ (B) $-\frac{4}{7}$ (C) 3 (D) 7 (E) -7
6. Which of the following points is farthest from $(-3, 5)$?
 (A) $(3, 5)$ (B) $(-5, 3)$ (C) $(-3, -5)$ (D) $(-5, -3)$ (E) $(5, 3)$
7. Three vertices of a square are $(2, 2)$, $(1, -1)$, and $(-2, 0)$. Find the fourth vertex.
 (A) $(1, 0)$ (B) $(-2, -2)$ (C) $(0, 1)$ (D) $(0, 2)$ (E) $(-1, 3)$
8. Two vertices of a square are $(2, 3)$ and $(6, 1)$. Which of the following best describes the possible value(s) for the area of the square?
 (A) 10 (B) 13 (C) 20 (D) 10 or 20 (E) 13 or 20
9. A circle has center $(2, 4)$ and passes through the point $(5, 0)$. Which of the following points is *not* on the circle?
 (A) $(6, 7)$ (B) $(7, 4)$ (C) $(4, -2)$ (D) $(-2, 1)$ (E) $(-1, 8)$

Answers	
1.	_____
2.	_____
3.	_____
4.	_____
5.	_____
6.	_____
7.	_____
8.	_____
9.	_____