Geometry Mid-Term Review Sheet

(1) Solve for x and y given the figure below.

(2) Solve for x and y given the figure below.

(3) Solve for x and y given the figure below.

(4) ABCDE is a regular pentagon. Find the measures of each of the numbered angles.

(5) Given the figure below, \( \triangle ABCD \) is a parallelogram, \( m \angle 1 = 40^\circ \), \( m \angle 4 = 100^\circ \), find the values of x and y and the measure of \( \angle ADC \).

(6) Find the values of x, y, and z in the figure below.
(7) Given the figure below, B and E are midpoints. Find the values of x, y, and z.

(8) Given the figure below, \( \overline{AE} \perp \overline{CF} \), \( \angle 2 = 4 \) \( \angle 3 \), \( \angle 5 = 30^\circ \). Find the measures of the remaining numbered angles.

(9) Find the values of x and y in the figure below.

(10) Given the figure below, \( \overline{AB} \parallel \overline{EH} \parallel \overline{CD} \), \( AE = DE \), \( AB = 12 \), \( FG = 3 \). Find EF, GH, CD.

(11) Use the given information to name the segments which MUST be parallel in the figure to the right. Consider each problem individually. If there are no such segments, write none.

(a) \( \angle 6 \cong \angle 10 \)    (e) \( \angle 6 \cong \angle 12 \)
(b) \( \angle 7 \cong \angle 1 \)    (f) \( \angle 8 \cong \angle 12 \)
(c) \( \angle 12 \cong \angle 15 \)    (g) \( \angle 6 \cong \angle 7 \)
(d) \( \angle 8 \cong \angle 9 \)    (h) \( \text{m} \angle 6 + \text{m} \angle 9 = 180 \)

(12) Find the measure of each interior and exterior angle of a regular 15–gon.
(13) Given the figure below, \( m\angle 1 = m\angle 2 \), and angles as marked, find the measure of each numbered angles.

(14) Given the figure below, \( l \parallel m \parallel n \), with sides as marked, find the values of \( x \), \( y \), and \( z \)

(15) Given the figure below with sides and angles as marked, use \( m\angle 1 \), \( m\angle 2 \), \( m\angle 3 \) to complete: _____ < _____ < _____

(16) Given the figure below, \( \overline{DE} \parallel \overline{FG} \parallel \overline{BC} \), and sides as marked, find the values of \( x \), \( y \), and \( z \).

(17) Given the figure to the right, \( \overline{BE} \perp \overline{AC} \), \( \overline{BF} \) and \( \overline{BD} \) are medians. Find \( x \), \( y \), \( z \), and \( DF \).
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(18) Given: \( \angle 1 \cong \angle 4 \), \( \overline{BA} \parallel \overline{EF} \)

Prove: \( \overline{BC} \parallel \overline{DG} \)

(19) Given: \( AC = BD \), \( AD = BC \)

Prove: \( AE = BE \)

(20) Given: \( AD = AE \), \( BD = CE \)

Prove: \( DF = EF \)

(21) Given: \( \angle 6 \cong \angle 10 \), \( \angle 2 \cong \angle 4 \)

Prove: \( \angle 11 \cong \angle 12 \)

(22) Given: \( \square ABCD \) is a parallelogram
\( BF = DE \)

Prove: \( \square AFCE \) is a parallelogram
(23) Given: \( \overline{AD} \) is a median, \( m \angle 2 > m \angle 1 \)
Prove: \( m \angle B > m \angle C \)

(24) Given: \( \overline{DE} \parallel \overline{BC} \), \( BD = CD \)
Prove: \( \overline{DE} \) bisects \( \angle ADC \)

(25) Given: \( AB = AC \), \( AD \neq AE \)
Prove: \( \overline{DE} \parallel \overline{BC} \)

(26) Given: \( \square BDEF \) and \( \square DEC \) are parallelograms
\( BD = CE \)
Prove: \( \triangle ABC \) is isosceles
(1) \( x = \frac{38}{3}, \ y = 10 \)

(2) \( x = \frac{46}{3}, \ y = \frac{140}{9} \)

(3) \( x = \frac{50}{3}, \ y = \frac{65}{3} \)

(4) \( m\angle 1 = 36^\circ, \ m\angle 2 = 72^\circ \)
   \( m\angle 3 = 36^\circ, \ m\angle 4 = 72^\circ \)
   \( m\angle 5 = 108^\circ, \ m\angle 6 = 36^\circ \)

(5) \( x = \frac{10}{3}, \ y = 1, \ m\angle ADC = 40^\circ \)

(6) \( x = 27^\circ, \ y = 41^\circ, \ z = 131^\circ \)
(7) \( x = \frac{5}{2} \), \( y = 30 \), \( z = 51 \)

(8) \( m\angle 1 = 30^\circ \), \( m\angle 2 = 72^\circ \)
\( m\angle 3 = 18^\circ \), \( m\angle 4 = 60^\circ \)
\( m\angle 5 = 30^\circ \), \( m\angle 6 = 150^\circ \)

(9) \( x = 12 \), \( y = \frac{31}{2} \)

(10) \( EF = 6 \), \( GH = 6 \), \( CD = 18 \)

(11) (a) \( \overline{AF} \parallel \overline{CH} \)
(b) \( \overline{AD} \parallel \overline{EH} \)
(c) \( \overline{AD} \parallel \overline{EH} \)
(d) none
(e) none
(f) \( \overline{BE} \parallel \overline{DG} \)
(g) none
(h) \( \overline{AF} \parallel \overline{CH} \)

(12) Each interior angle is \( 156^\circ \), each exterior angle is \( 24^\circ \)
(13) \( m \angle 1 = 22^\circ, m \angle 2 = 22^\circ \)  
\( m \angle 3 = 104^\circ, m \angle 4 = 112^\circ \)  
\( m \angle 5 = 36^\circ \)

(14) \( x = \frac{7}{2}, y = 3, z = 11 \)

(15) \( m \angle 3 > m \angle 1 > m \angle 2 \)

(16) \( x = 7, y = 21, z = 5 \)

(17) \( x = 6.5, y = 10, z = 6.5, \text{ DF} = \frac{21}{2} \)