Geometry: Trapezoid Midsegment & Kite

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DIRECTIONS *Apply the Midsegment (Midline) Theorem and kite properties to solve each problem. Show all work.*

1 Find the midsegment m of the trapezoid:

$b_1 = 9, \quad b_2 = 13$

Answer: _____

2 Find the midsegment m of the trapezoid:

$b_1 = 4, \quad b_2 = 18$

Answer: _____

3 Find the missing base b2 of the trapezoid:

$m = 9, \quad b_1 = 6$

Answer: _____

4 Find the missing base b1 of the trapezoid:

$m = 7, \quad b_2 = 9$

Answer: _____

5 Find x using the Midsegment Theorem:

$b_1 = 3x + 2,\ b_2 = 3x + 6,\ m = 10$

Answer: _____

6 Find the non-vertex angles B and D of the kite:

$\angle A = 70^\circ, \quad \angle C = 90^\circ$

Answer: _____

7 Find the missing vertex angle A of the kite:

$\angle B = \angle D = 90^\circ, \quad \angle C = 50^\circ$

Answer: _____

8 Find the perimeter of the kite (two pairs of equal sides):

$a = 11, \quad b = 17$

Answer: _____

9 Diagonal d2 is bisected by d1 in the kite. Find the full length of d2:

$\overline{WX} = 4$

Answer: _____

10 Diagonals of a kite are perpendicular. Find angle x:

$\angle 1 = 60^\circ, \quad \angle 2 = 90^\circ$

Answer: _____

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Answer Key & Solutions

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TEACHER NOTES

Midsegment: m = (b1+b2)/2. Kite: non-vertex angles are equal; diagonals are perpendicular; one diagonal bisects the other. Angle sum = 360 degrees.

1 Find the midsegment m of the trapezoid:

$b_1 = 9, \quad b_2 = 13$

= $m = 11$

m = (b_1+b_2)/2 = (9+13)/2 = 11.

2 Find the midsegment m of the trapezoid:

$b_1 = 4, \quad b_2 = 18$

= $m = 11$

m = (b_1+b_2)/2 = (4+18)/2 = 11.

3 Find the missing base b2 of the trapezoid:

$m = 9, \quad b_1 = 6$

= $b_2 = 12$

b_2 = 2m - b_1 = 2(9)-6 = 12.

4 Find the missing base b1 of the trapezoid:

$m = 7, \quad b_2 = 9$

= $b_1 = 5$

b_1 = 2m - b_2 = 2(7)-9 = 5.

5 Find x using the Midsegment Theorem:

$b_1 = 3x + 2,\ b_2 = 3x + 6,\ m = 10$

= $x = 2$

Solve (3x+2+3x+6)/2=10 for x=2.

6 Find the non-vertex angles B and D of the kite:

$\angle A = 70^\circ, \quad \angle C = 90^\circ$

= $\angle B = \angle D = 100^\circ$

Non-vertex angles are equal. B = D = (360-70-90)/2 = 100 deg.

7 Find the missing vertex angle A of the kite:

$\angle B = \angle D = 90^\circ, \quad \angle C = 50^\circ$

= $\angle A = 130^\circ$

A = 360-2(90)-50 = 130 degrees.

8 Find the perimeter of the kite (two pairs of equal sides):

$a = 11, \quad b = 17$

= $P = 56$

P = 2(11)+2(17) = 22+34 = 56.

9 Diagonal d2 is bisected by d1 in the kite. Find the full length of d2:

$\overline{WX} = 4$

= $\overline{WY} = 8$

WY = 2 x WX = 2 x 4 = 8.

10 Diagonals of a kite are perpendicular. Find angle x:

$\angle 1 = 60^\circ, \quad \angle 2 = 90^\circ$

= $\angle x = 30^\circ$

Angles in triangle sum to 180. x = 180-90-60 = 30 deg.

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