Section 7.3
p. 309: 1, 2, 6, 8, 10, 13, 14-19, 21, 23

#1 Find the sum of the measures of the angles of

a. A quadrilateral $180(4-2)$ $180(2)$ 360°

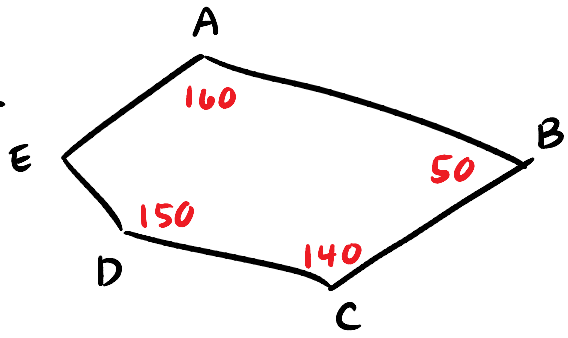
b. A heptagon → $180(7-2)$ $180(5)$ 900

c An octogon $180(8-2)$ $180(6)$ 1080

d. A dodecagon → $180(12-2)$ $180(10)$ 1800

e. 93-gon → $180(93-2)$ $180(91)$ $16,380$

#2



$180(5-2)$ $180(3)$ 540

$540 - 160 - 50 - 140 - 150 = \boxed{40}$

#6
a. 360
b. 360
c. 360
d. 360°

#8 On a clock a segment is drawn connecting the mark at the 12 and the mark at the 1; then another segment connecting the mark at the 1 and the mark at the 2; and so forth, all the way around the clock.

a. What is the sum of the measures of the angles of the polygon formed?

$180(12-2)$ $180(10)$ 1800

b. What is the sum of the measure of the exterior angles?

360°

10. How many sides does a polygon have if the sum of the measures of its angles is.

a. 900? $900 = 180(n-2)$, $5 = n-2$, $\boxed{7 = n}$

b. 1440? $1440 = 180(n-2)$, $8 = n-2$, $\boxed{10 = n}$

c. 2880? $2880 = 180(n-2)$, $16 = n-2$, $\boxed{18 = n}$

d. $180x - 720$? $\frac{180x}{180} - \frac{720}{180} = \frac{180(n-2)}{180}$, $x - 4 = n-2$, $\boxed{x - 2 = n}$

e. 436? $436 = 180(n-2)$, $2.422 = n-2$, $4.422 = n$ (Impossible)

f. Six Right angles? $540 = 180(n-2)$, $3 = n-2$, $\boxed{5 = n}$

#13 What are the names of the polygons that contain the following numbers of diagonals

a. 14 $14 = \frac{n(n-3)}{2}$, $28 = n^2 - 3n$, $0 = n^2 - 3n - 28$, $0 = (n-7)(n+4)$, $n = 7, -4$, $\boxed{\text{heptagon}}$

b. 35 $35 = \frac{n(n-3)}{2}$, $70 = n^2 - 3n$, $0 = n^2 - 3n - 70$, $0 = (n-10)(n+7)$, $n = 10, -7$, $\boxed{\text{Decagon}}$

b. 209 $209 = \frac{n(n-3)}{2}$, $418 = n^2 - 3n$, $0 = n^2 - 3n - 418$, $0 = (n-22)(n+19)$, $n = 22, -19$, $\boxed{\text{22-gon}}$

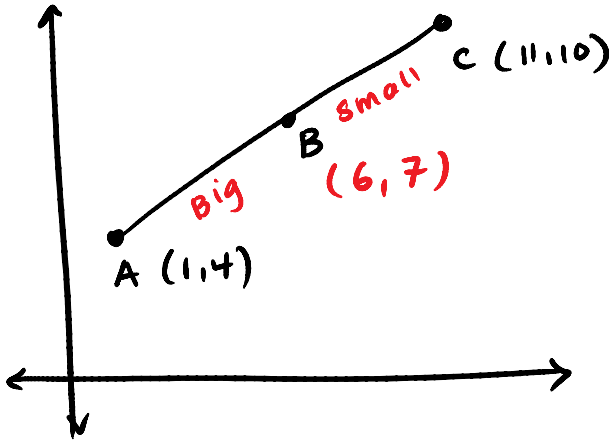
#15 Tell whether each statement is Always, Sometimes, or Never True

a. As the number of sides of a polygon increases, the number of exterior angles increases A
b. As the number of sides of a polygon increases, the sum of the measure of the exterior angles increases N
c. The sum of the lengths of the diagonals of a polygon is greater than the perimeter of the polygon S
d. The sum of the measures of the angles of a polygon formed by joining consecutive midpoints of a polygon's sides is equal to the sum of the measures of the angles of the original problem A

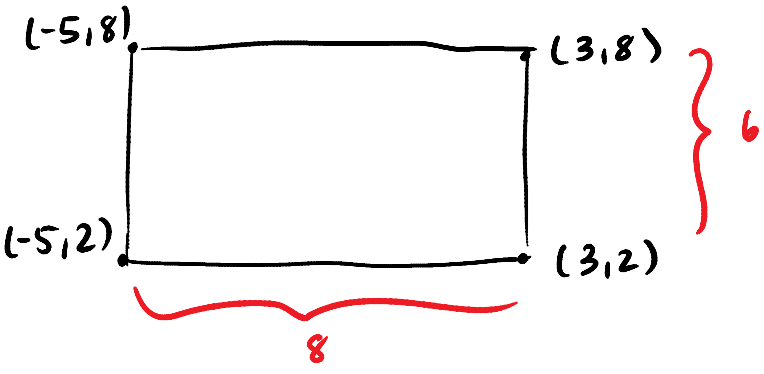
16. If AB > BC, find the restrictions on Point B's

a. x coordinate $6 < x < 11$

b. y coordinate $7 < x < 10$

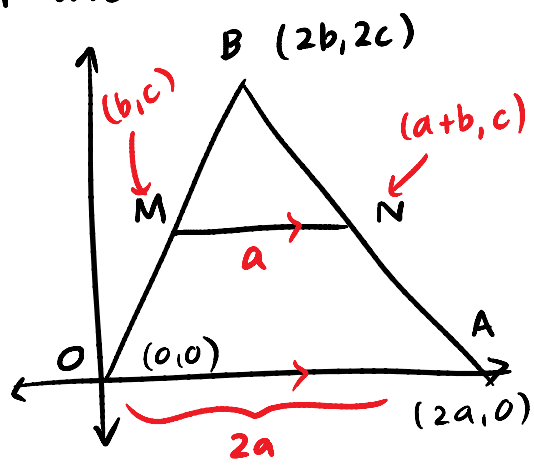


#17 Find the area of a rectangle with vertices (-5,2), (3,2), (3,8), and (-5, 8)



$6 \times 8 = 48$

#18 Using the diagram, write a proof of the midline Theorem



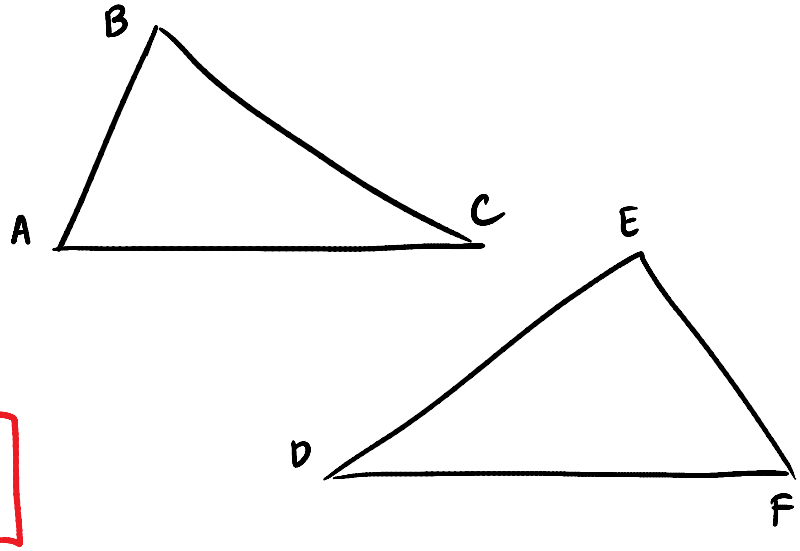
$M = \left(\frac{0+2b}{2}, \frac{0+2c}{2}\right) = (b, c)$

$N = \left(\frac{2a+2b}{2}, \frac{2c+0}{2}\right) = (a+b, c)$

$OA = 2a$
$MN = a$
} so $\boxed{MN = \frac{1}{2}OA}$

$m_{OA} = 0$
$m_{MN} = 0$
} same slope so $\boxed{\overline{MN} \parallel \overline{OA}}$

#19 If three of the following four statements are chosen at random as given information, what is the probability that the fourth statement can be proved?



a. $\angle C \cong \angle D$

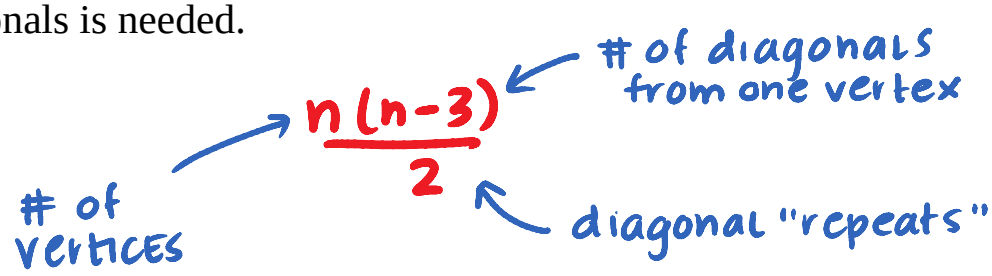
b. $\overline{AC} \cong \overline{DF}$

c $\angle A \cong \angle F$

$\boxed{3/4}$

d. $\overline{AB} \cong \overline{EF}$

#21 Explain why each of the three ingredients in the formula for the total number of diagonals is needed.



#23 Seven of the angles of a decagon have measures whose sum is 1220. Of the remaining three angles, exactly two are complementary and exactly two are supplementary. Find the measures of these three angles

Sum of int $\angle$s $= 180(n-2)$

$= 180(10-2)$

$= 180(8)$

$= 1440$

$1440 - 1220 = 220$

x, $90-x$, $180-x$

$50°$, $40°$, $130°$

$x + 90 - x + 180 - x = 220$

$270 - x = 220$

$-x = -50$

$x = 50$