

Geometry

Review 8.1-8.3

Name Key

What is the formula to find the sum on the interior angles of a convex polygon?

$$(n-2)180^\circ = \text{sum of int. } \angle s$$

The sum of the exterior angles of a convex polygon is ALWAYS 360° .

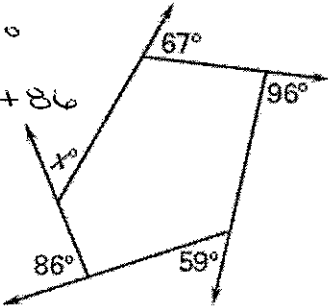
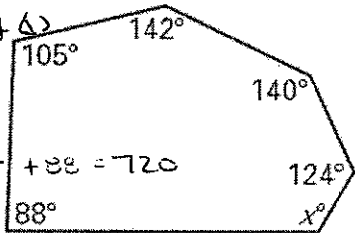
Find the sum of the measures of the interior angles of the indicated convex polygon.

1. Decagon $S = (10-2)180^\circ$ $S = (8)180^\circ$ <u>Sum int $\angle s = 1440^\circ$</u>	2. 13-gon $S = (13-2)180$ $S = (11)180^\circ$ <u>Sum int $\angle s = 1980^\circ$</u>	3. hexagon $S = (6-2)180^\circ$ $S = (4)180^\circ$ <u>Sum of int $\angle s = 720^\circ$</u>
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Classify the polygon by the # of sides if the sum of the measures of the interior angles is given.

4. 900° $900 = (n-2)180^\circ$ $5 = n-2$ $7 = n$ <u>heptagon</u>	5. 8640° $8640 = (n-2)180^\circ$ $48 = n-2$ $50 = n$ <u>50-gon</u>	6. 180° $180 = (n-2)180^\circ$ $1 = n-2$ $3 = n$ <u>triangle</u>
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Find the value of x.

7. Sum ext $\angle s = 360^\circ$ $360 = x + 67 + 96 + 59 + 86$ $360 = x + 308$ $52 = x$ <u>$x = 52$</u> 	8. $(6-2)180^\circ = \text{sum int } \angle s$ $(4)180^\circ = \text{sum}$ $720^\circ = \text{sum}$ $x + 124 + 140 + 142 + 105 + 88 = 720$ $x + 599 = 720$ $x = 121$ <u>$x = 121$</u> 
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Find the measure of an interior angle and an exterior angle of the REGULAR polygon.

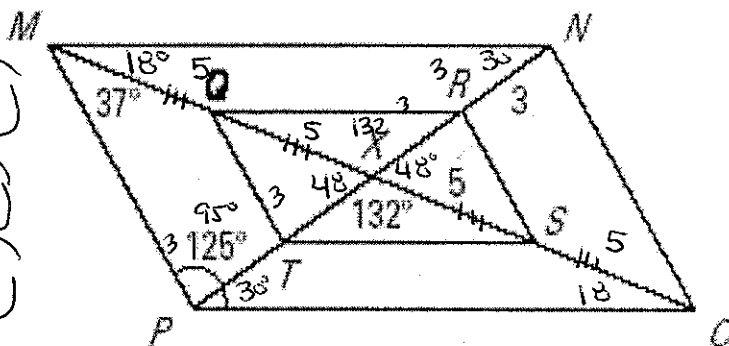
9. Regular decagon 10 sides $\frac{360^\circ}{10} = 36^\circ$ <u>int $\angle = 144^\circ$</u> <u>ext $\angle = 36^\circ$</u> $180^\circ - 36^\circ = 144^\circ$	10. Regular 30-gon $\frac{360^\circ}{30} = 12^\circ$ <u>int $\angle = 168^\circ$</u> <u>ext $\angle = 12^\circ$</u> $180^\circ - 12^\circ = 168^\circ$	11. Regular 45-gon $\frac{360^\circ}{45} = 8^\circ$ <u>int $\angle = 172^\circ$</u> <u>ext $\angle = 8^\circ$</u> $180^\circ - 8^\circ = 172^\circ$
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Find the value of n for each regular n-gon described.

12. Each interior angle of the regular n-gon has a measure of 165° . $180^\circ - 165^\circ = 15^\circ$ $\frac{360^\circ}{15^\circ} = 24$ <u>24-gon</u>	13. Each exterior angle of the regular n-gon has a measure of 40° . $\frac{360^\circ}{40^\circ} = 9$ <u>nonagon</u>
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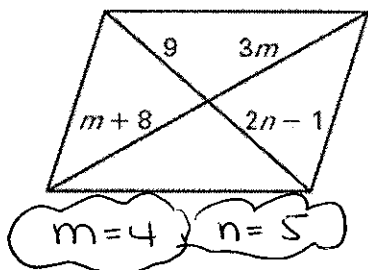
MNOP is a parallelogram. Points Q, R, S, and T are midpoints of \overline{MX} , \overline{NX} , \overline{OX} , and \overline{PX} .

14. $PN = 12$
15. $MQ = 5$
16. $XO = 10$
17. $m\angle NMQ = 18^\circ$
18. $m\angle NXO = 48^\circ$
19. $m\angle MNP = 30^\circ$
20. $m\angle NPO = 30^\circ$
21. $m\angle NOP = 55^\circ$

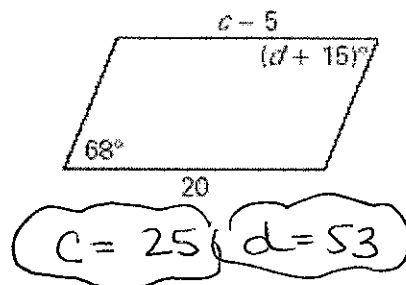


Find the value of each variable in the parallelogram.

- 22.
- $$3m = m + 8$$
- $$2m = 8$$
- $$m = 4$$
- $$9 = 2n - 1$$
- $$10 = 2n$$
- $$5 = n$$

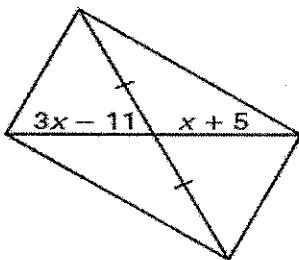


23. $c - 5 = 20$
 $c = 25$
 $d + 15 = 68$
 $d = 53$



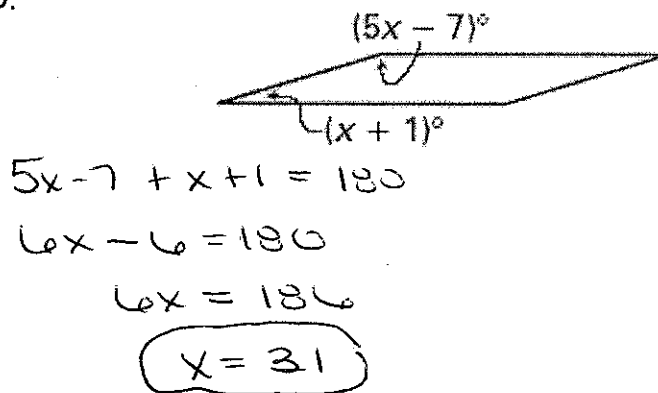
Find the values of x that ensure each quadrilateral is a parallelogram.

- 24.
- $$3x - 11 = x + 5$$
- $$2x = 16$$
- $$x = 8$$



Diagonals bisect each other

25.



Draw quadrilateral ABCD in the coordinate plane and then determine whether it's a parallelogram. Explain your reasoning.

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

* $AD = \sqrt{(-2+2)^2 + (3-0)^2} = 3$

* $AB = \sqrt{(-2-3)^2 + (3-2)^2} = \sqrt{26}$

* $BC = \sqrt{(3-3)^2 + (2+1)^2} = 3$

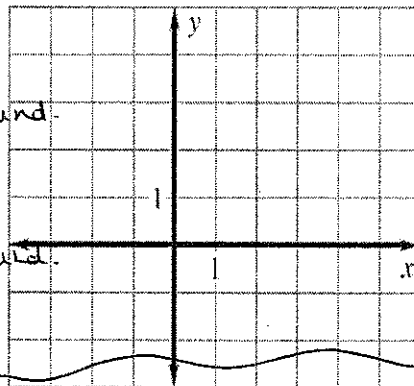
* $DC = \sqrt{(3+2)^2 + (-1-0)^2} = \sqrt{26}$

* $m_{AD} = \frac{3-0}{-2+2} = \frac{3}{0} = \text{und.}$

* $m_{AB} = \frac{3-2}{-2-3} = \frac{1}{-5} = -\frac{1}{5}$

* $m_{BC} = \frac{2+1}{3-3} = \frac{3}{0} = \text{und.}$

* $m_{DC} = \frac{-1-0}{3+2} = \frac{-1}{5} = -\frac{1}{5}$



Multiple ways!

* Both pair opp sides \parallel
 \rightarrow Slopes

* Both pair of opp sides \cong
 \rightarrow distance formula

* 1 pair opp sides \parallel + \cong
 1 set with distance + slope