Quadrilateral Practice

Name: _Key_

1. Find the sum of the measures of the interior angles of a 32-gon.

$$180(n-2) = 180(32-2) = 5400$$

2. The measure of an interior angle of a regular polygon is 60. Find the number of sides in the polygon.

$$60n = 180(n-2)$$
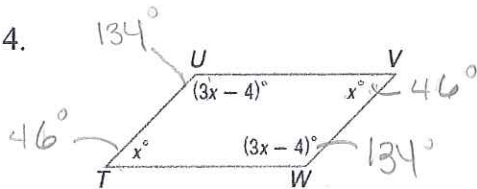$$60n = 180n - 360$$

$$120n = 360$$
$$\boxed{n = 3}$$

3. Find the measure of an exterior angle and an interior angle given a regular polygon with 18 sides.

$$180(18-2) = 2880 \div 18 = 160° \text{ interior}$$
$$180 - 160 = 20° \text{ Exterior}$$
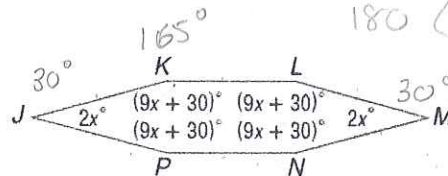
Find the measure of each interior angle for #4-7.

4.

134°

U   V
$(3x-4)°$ $x°$ ∠46°
46°
$x°$ $(3x-4)°$ 134°
T   W

$$3x-4 + x + 3x-4 + x = 360 \qquad 8x = 368$$
$$8x - 8 = 360 \qquad\qquad x = 46$$

5.

$180(6-2) = 720$

165°
30°   K   L   30°
J $2x°$ $(9x+30)°$ $(9x+30)°$ $2x°$ M
$(9x+30)°$ $(9x+30)°$
P   N

$$4(9x+30) + 2(2x) = 720$$
$$36x + 4x + 120 = 720$$
$$40x = 600 \qquad x = 15$$

6. parallelogram MNPQ with
   m∠M = 10x and m∠N = 20x.

M   N
10x   20x
Q   P

$$10x + 20x = 180$$
$$30x = 180$$
$$x = 6$$

$$\boxed{\begin{array}{l}\angle m = \angle P = 60 \\ \angle N = \angle Q = 120\end{array}}$$

7. isosceles trapezoid TWXY with
   m∠Z = 30x and m∠T = 20x.

T   W
20x
30x
Z   Y

$$36x + 20x = 180$$
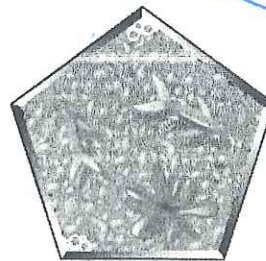$$50x = 180$$
$$x = 3.6$$

$$\boxed{\begin{array}{l}\angle T = \angle W = 72 \\ \angle Z = \angle Y = 108\end{array}}$$
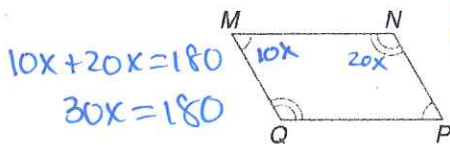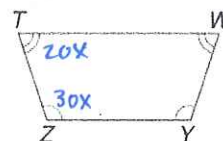
8. The regular polygon at the right is the base of a fish tank. Find the sum of the measures of the interior angles of the polygon.

$$180(5-2) = 540°$$

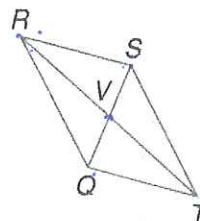**Complete each statement about parallelogram QRST.**

R
S
V
Q
T

9. $\overline{SV} \cong \underline{QV}$

10. $\triangle VRS \cong \underline{\triangle VTQ}$
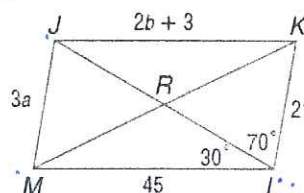
11. ∠TSR is supplementary to _∠STQ_
    or
    ∠SRQ

Use parallelogram JKLM for #12-17 to find each measure or value.

12. $m\angle MJK = 100°$ 13. $m\angle JML = 80°$
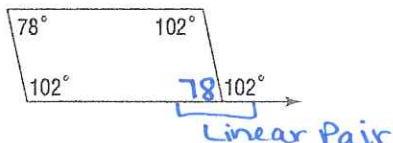
14. $m\angle JKL = 80°$ 15. $m\angle KJL = 30°$

16. a $a=7$
    $3a=21$

17. b $2b+3=45$
        $2b=42$
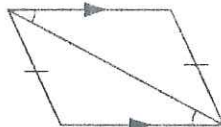 $b=21$

Diagram: parallelogram J (top-left), K (top-right with side $2b+3$), $3a$ on left side JM, R center, 21 on right side KL, $70°$ and $30°$ at L, M bottom-left, 45 on bottom ML.

Determine whether each quadrilateral is a parallelogram for #18-19. Justify your answer.

18.

Diagram: quadrilateral with angles 78°, 102° (top), 102°, 78°, 102° (bottom) — Linear Pair

Yes ⟹ opp angles ≅

19.

Diagram: parallelogram with marks.

NO → only 1 pair opp
Sides ≅ or ∥
NOT Both.

20. ABCD is a rectangle. If AC = 30 – x and BD = 4x – 60, find x.

Diagram: rectangle with D (top-left), C (top-right), A (bottom-left), B (bottom-right), diagonals drawn.
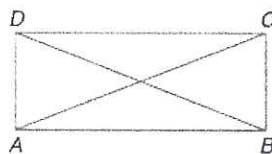
$30-x = 4x-60$
$90 = 5x$
$\boxed{18 = x}$

#21-24 In rhombus ABCD, AB = 2x + 3 and BC = 5x.

Diagram: rhombus with A (top-left), B (top-right, side $2x+3$), E center, $5x$ on right, D (bottom-left), C (bottom).
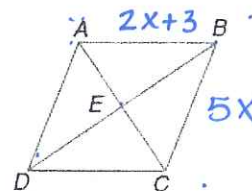
21. Find x
$2x+3 = 5x$
$3 = 3x$
$\boxed{1 = x}$

22. Find AD.
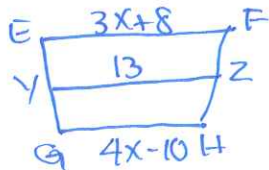$5(1) = \boxed{5 = AD}$

23. Find $m\angle AEB$
$\boxed{90°}$

24. Find $m\angle BCD$ if $m\angle ABC = 83.2$
$\angle BCD = 180 - 83.2 = \boxed{96.8}$

25. EFGH is an isosceles trapezoid with bases $\overline{EF}$ and $\overline{GH}$ and median $\overline{YZ}$.
If EF = 3x + 8, HG = 4x – 10, and YZ = 13, find x.

Diagram: trapezoid E (top-left), F (top-right), 3X+8 top, 13 middle (Y left, Z right), G, 4X-10, H bottom.

$13 = \frac{1}{2}(3x+8+4x-10)$
$26 = 7x - 2$
$28 = 7x$
$\boxed{x=4}$

26. For trapezoid QRST, A and B are midpoints of the legs.
Find AB, $m\angle Q$, and $m\angle S$.

Diagram: trapezoid T (top-left), 12, S (top-right), 120° at T, A (left), B (right), 45° at R, Q (bottom-left), 20, R (bottom-right).

$AB = \frac{1}{2}(12+20) = \frac{1}{2}(32) = \boxed{16}$
$\angle Q = 180 - 120 = \boxed{60°}$
$\angle S = 180 - 45 = \boxed{135°}$