



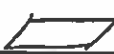
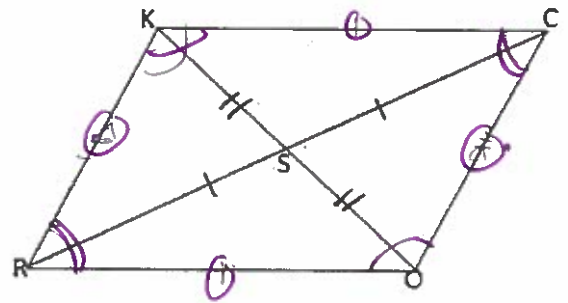


True or false:

- F 1. The diagonals of a trapezoid bisect each other.
- F 2. A rhombus is always a square.
- F 3. To prove a quadrilateral is a parallelogram, it is enough to show one pair of opposite sides is parallel.
- F 4. All the angles of a parallelogram are congruent. 
- F 5. Each diagonal of a rectangle always bisects a pair of opposite angles.
- T 6. Opposite sides of a parallelogram must be congruent. ✓
- F 7. The diagonals of a rectangle are always perpendicular.
- T 8. Consecutive angles of a rhombus are always supplementary. ✓
- T 9. Opposite sides of a rectangle must be parallel.

State the definition or theorem enables you to deduce from the given information that quadrilateral ROCK is a parallelogram:

- 10. $\overline{OR} \cong \overline{CK}$; $\overline{OC} \cong \overline{RK}$ if both pairs of opp sides \cong then 
- 11. $\overline{RK} \cong \overline{OC}$; $\overline{RK} \parallel \overline{OC}$ if one pair of opp sides \cong & \parallel then 
- 12. $\angle ROC \cong \angle CKR$; $\angle KRO \cong \angle OCK$ if both pairs of opp \angle s \cong then 
- 13. $RS = SC$; $KS = SO$ if diagonals bisect each other then 



14. GRIP is a rectangle. Given the following information, find the remaining values on the rectangle.

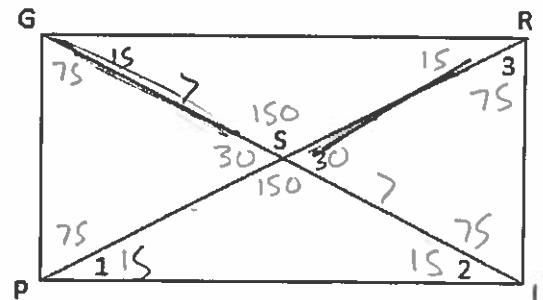
Given: $m\angle 1 = 15$, $GS = 2x - 1$, $SR = 3x - 5$ $x = 4$

Find

$m\angle GRS$ 15° $m\angle ISR$ 30° $m\angle GSP$ 30°

$m\angle GSR$ 150° $m\angle PGR$ 90° $m\angle RIP$ 90°

PR 14 GP 3.6 GR 13.5

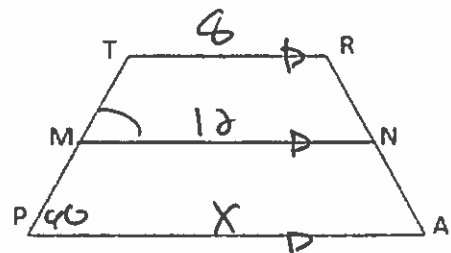


M and N are midpoints of TP and RA. TRAP is a trapezoid. Complete the following.

15. If $TP = RA$, then TRAP is a(n) iso trap.

16. If $MN = 12$ and $TR = 8$, then $PA =$ 16.

17. If $TP = RA$ and $m\angle P = 60$ then $m\angle A =$ 60° and $m\angle TMN =$ 60°



$$\frac{8+x}{2} = 12$$

$$8+x = 24$$

$$x = 16$$

RAKE is a parallelogram. Complete the following.

18. $ER = 12$, $KA =$ 12.

19. If $RS = 14$, $RK =$ 28.

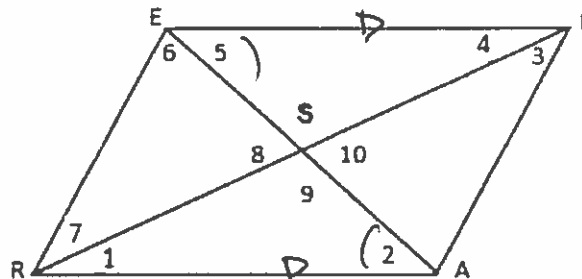
20. If $m\angle ARE = 47$, then $m\angle AKE =$ 47° .

21. If $ES = 5x - 3$ and $SA = 12$, then $x =$ 3.

22. If $EK = 11x + 9$ and $RA = 42$, then $x =$ 3.

23. If $m\angle 2 = 4x + 6$ and $m\angle 5 = 2x + 28$ then $x =$ 11.

24. If $m\angle RAK = 110$ and \angle , then $x =$ 11.



$$m\angle KER = 10x$$

$$110 = 10x$$

$$11 = x$$

$$4x + 6 = 2x + 28$$

$$2x = 22$$

$$x = 11$$

$$11x + 9 = 42$$

$$11x = 33$$

$$x = 3$$

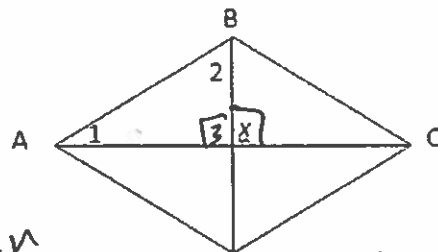
$$5x - 3 = 12$$

$$5x = 15$$

$$x = 3$$

25. Given Rhombus ABCD

Prove: $\angle 1$ and $\angle 2$ are complements



ABCD is Rhombus
 $\overline{BD} \perp \overline{AC}$

$\angle 3$ is rt \angle

$$m\angle 1 + m\angle 2 + m\angle 3 = 180$$

$$m\angle 3 = 90^\circ$$

$$m\angle 1 + m\angle 2 = 90$$

$\angle 1$ & $\angle 2$ comp

Given

if Rhombus then^D diag \perp

def of \perp

inter \angle s of Δ have 180 sum

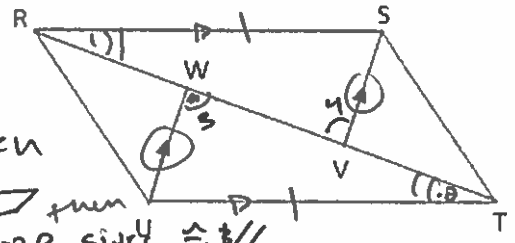
def of rt \angle

subtraction

def of comp

26. Given parallelogram RSTU; $\overline{SV} \parallel \overline{UW}$

Prove: $\overline{SV} \cong \overline{UW}$

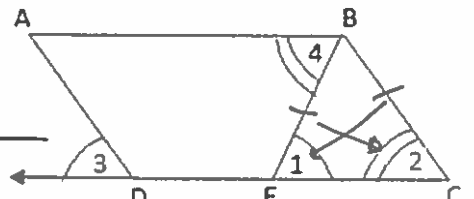


\square RSTU & $\overline{SV} \parallel \overline{UW}$
 $\overline{RS} \parallel \overline{UT}$ & $\overline{RS} \cong \overline{UT}$ (S)
 $\angle 1 \cong \angle 2$
 $\angle 3 \cong \angle 4$
 $\triangle TUW \cong \triangle RSU$
 $\overline{SV} \cong \overline{UW}$

Given
 if \square then
 opp sides \cong & \parallel
 if lines \parallel then alt int \angle s \cong
 " "
 AAS
 CPCTC

27. Given $\overline{BE} \cong \overline{BC}$; $\angle 3 \cong \angle 1$; $\angle 2 \cong \angle 4$

Prove ABCD is a parallelogram



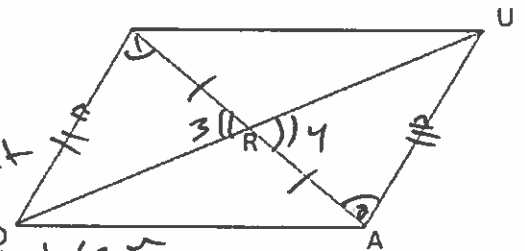
$\angle 1 \cong \angle 2$
 $\angle 2 \cong \angle 3$
 $\overline{AD} \parallel \overline{BC}$
 $\angle 1 \cong \angle 4$
 $\overline{AB} \parallel \overline{DC}$
 \square ABCD

Given
 if 2 sides of $\triangle \cong$ then \angle s opp \cong
 transitive prop \cong
 if corr \angle s \cong then lines \parallel
 trans prop \cong
 if alt int \angle s \cong then lines \parallel
 def of parallelogram

28. Given R is the midpoint of \overline{QA} ; $\overline{QD} \parallel \overline{UA}$

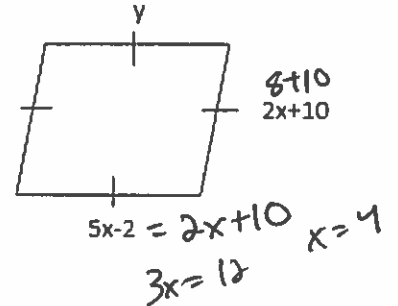
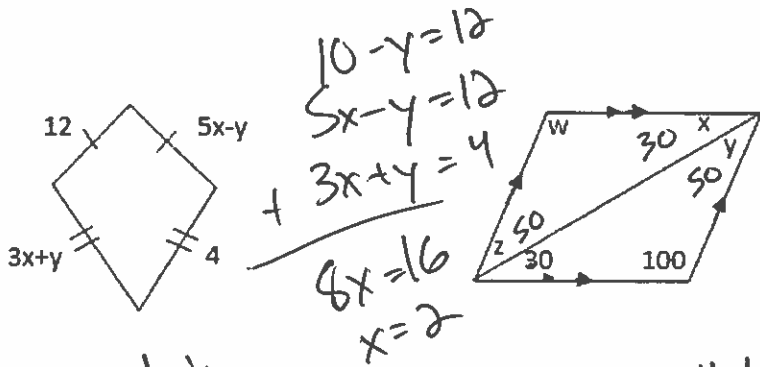
Prove QUAD is a parallelogram

Q



R is midpoint of \overline{QA} given
 $\overline{QR} \cong \overline{RA}$
 $\angle 3 \cong \angle 4$
 $\angle 3 \cong \angle 4$
 $\triangle RQD \cong \triangle RAU$
 $\overline{QD} \cong \overline{UA}$
 \square QUAD

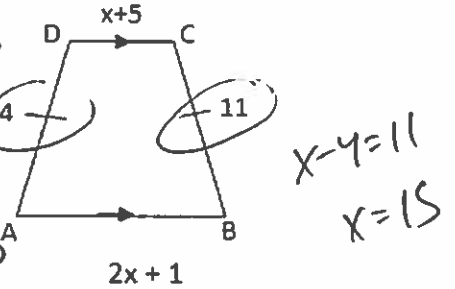
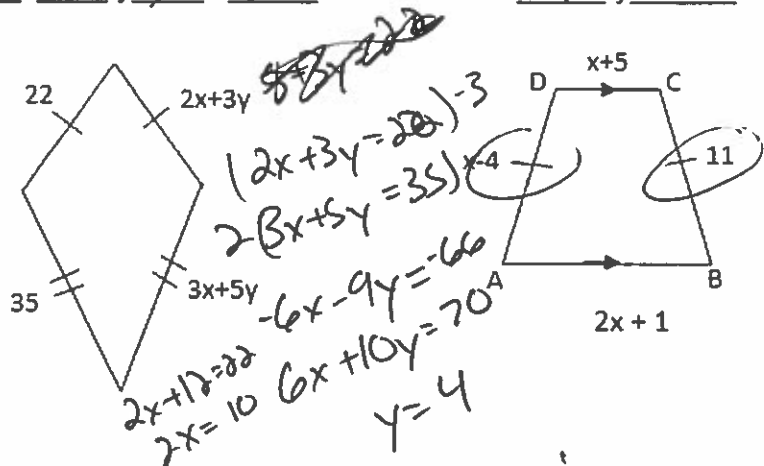
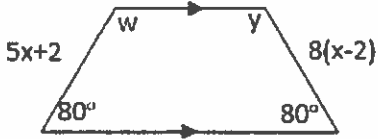
given
 def of midpoint
 if lines \parallel then
 vert \angle s \cong alt int \angle s \cong
 ASA
 CPCTC
 if one set of opp sides \parallel & \cong then \square



29. Name kite
 x 2 y 2

30. Name parallelogram
 w 100 x 30 y 50 z 50

31. Name Rhombus
 x 4 y 16



32. Name iso trap
 x 6 w 100 y 100

33. Name kite
 x 5 y 4

34. Name iso trap
 x 15 AB 31 DC 20

Find the slope and length of each side of quadrilateral ABCD and give the most precise name for it.

35. A(3,5) B(7,6) C(6,2) D(2,1)

slope AB: $\frac{6-5}{7-3} = \frac{1}{4}$ slope BC: $\frac{2-6}{6-7} = \frac{-4}{-1} = 4$ slope CD: $\frac{1-2}{2-6} = \frac{-1}{-4} = \frac{1}{4}$ slope DA: $\frac{5-1}{3-2} = \frac{4}{1} = 4$

AB = $\sqrt{(7-3)^2 + (6-5)^2} = \sqrt{14^2 + 1^2} = \sqrt{197}$ BC = $\sqrt{(6-7)^2 + (2-6)^2} = \sqrt{1^2 + 16} = \sqrt{17}$ CD = $\sqrt{(2-6)^2 + (1-2)^2} = \sqrt{16 + 1} = \sqrt{17}$ DA = $\sqrt{(3-2)^2 + (5-1)^2} = \sqrt{1 + 16} = \sqrt{17}$

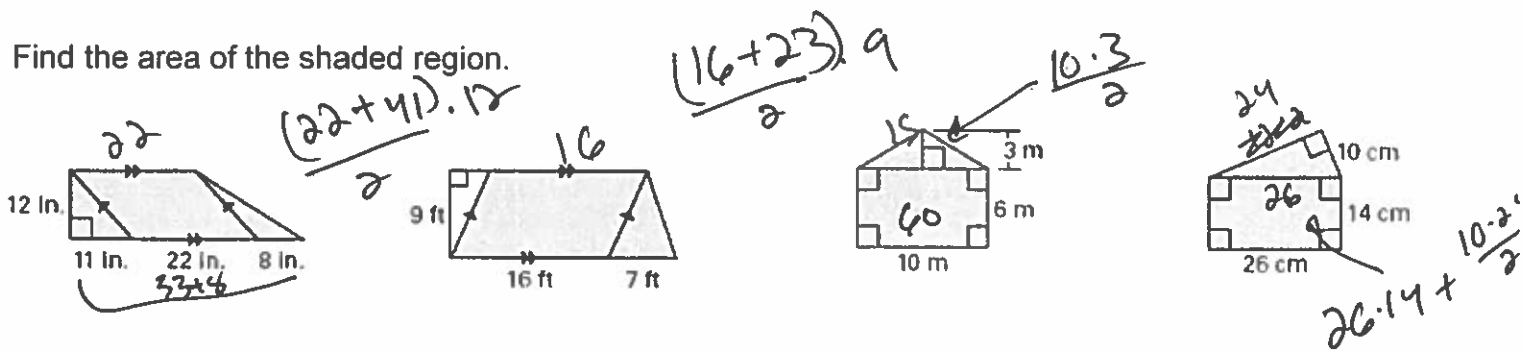
36. A(-2, -3) B(4,0) C(3, 2) D(-3, -1)

slope AB: $\frac{0-(-3)}{4-(-2)} = \frac{3}{6} = \frac{1}{2}$ slope BC: $\frac{2-0}{3-4} = \frac{2}{-1} = -2$ slope CD: $\frac{-1-2}{-3-3} = \frac{-3}{-6} = \frac{1}{2}$ slope DA: $\frac{-3-(-1)}{-2-(-3)} = \frac{-2}{-1} = 2$

AB = $\sqrt{(4-(-2))^2 + (0-(-3))^2} = \sqrt{36 + 9} = \sqrt{45}$ BC = $\sqrt{(3-4)^2 + (2-0)^2} = \sqrt{1 + 4} = \sqrt{5}$ CD = $\sqrt{(-3-3)^2 + (-1-2)^2} = \sqrt{36 + 9} = \sqrt{45}$ DA = $\sqrt{(-3-(-2))^2 + (-1-(-3))^2} = \sqrt{1 + 4} = \sqrt{5}$

Handwritten notes: "rectangle" (circled), "rhombus" (circled), and "rectangle" (circled).

Find the area of the shaded region.



38 378 in²

39 247.5 ft²

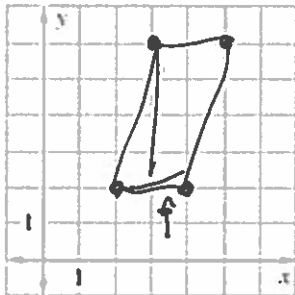
40 75 m²

41 484 cm²

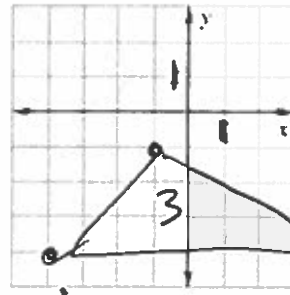
Graph the points to create a polygon. Find the area of the polygon.

42. A(2, 2) B(3, 6) C(5, 6) D(4, 2)

43. P(-4, -4) Q(-1, -1) R(5, -4)



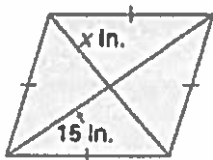
Handwritten: $2 \cdot 4$
8 u²



Handwritten: $\frac{27}{2}$
135 u²

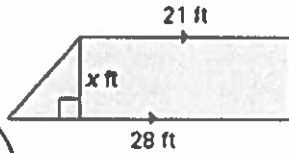
Find the value of x using the given information.

Area = 330 in²



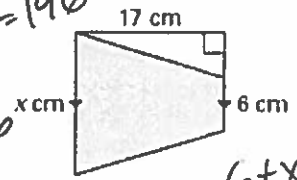
Handwritten: $\frac{30 \cdot x}{2} = 330$
x = 11 in

Area = 196 ft²



Handwritten: x = 8 ft

Area = 187 cm²



Handwritten: $\frac{28+21}{2} \cdot x = 196$
 $\frac{49}{2} x = 196$
 $x = 4$

Handwritten: $17 \cdot \frac{6+x}{2} = 187$
x = 16 cm²

44 x = 11

45 x = 8 ft

46 x = 16 cm²

Two figures have a given area ratio. Find the ratio of their perimeters.

47. Ratio of areas = 50:18

Handwritten: $\frac{20}{50} \div \frac{20}{18} = \frac{20}{25} \cdot \frac{9}{20} = \frac{9}{5}$
 $\frac{5}{3}$

48. Ratio of areas = 16:81

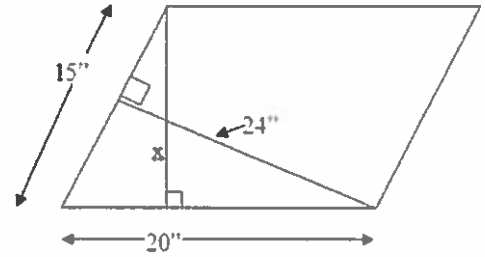
Handwritten: $\frac{16}{81} \div \frac{20}{20} = \frac{4}{9}$
 $\frac{4}{9}$

49. Ratio of areas = 25:100

Handwritten: $\frac{25}{100} \div \frac{20}{20} = \frac{1}{4}$
 $\frac{1}{2}$

Handwritten: $\frac{6+x}{2} = 11$
 $6+x = 22$
 $x = 16$

61. Find the value of x for the given parallelogram.

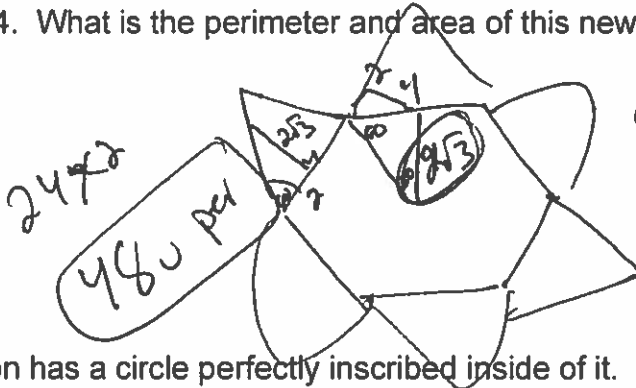


$$15 \cdot 24 = 20 \cdot x$$

$$360 = 20x$$

$$18'' = x$$

62. A star is created by putting equilateral triangles on the edges of a regular hexagon that has a perimeter of 24. What is the perimeter and area of this new shape?

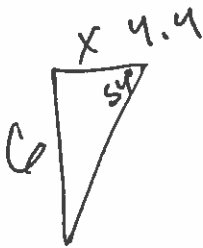


$$6\Delta \rightarrow \left(\frac{4 \cdot 2\sqrt{3}}{2} \right) 6 + \frac{1}{2} (2\sqrt{3}) 24 \text{ hex}$$

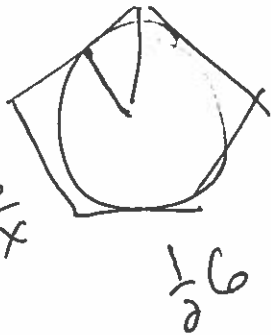
$$24\sqrt{3} + 24\sqrt{3}$$

$$48\sqrt{3} \text{ area}$$

63. A pentagon has a circle perfectly inscribed inside of it. If the circle has an area of $36\pi \text{ m}^2$, what is the area of the pentagon not covered by the circle?



$$\tan 54 = \frac{6}{x}$$



$$36\pi = \pi r^2$$

$$36 = r^2$$

$$6 = r$$

$$17.7 \text{ m}^2$$

tree ☺

64. Timmy has accidentally burned a large triangular patch out of his garden. He now knows that grease fires should be treated differently than others. The triangle has side lengths of 6, 7, and 8 yards. How big is the area that Timmy accidentally incinerated?

$$\sqrt{s(s-a)(s-b)(s-c)}$$

$$\sqrt{10.5(10.5-6)(10.5-7)(10.5-8)}$$



$$20.3 \text{ yd}^2$$

$$s = \frac{a+b+c}{2}$$

$$\frac{6+7+8}{2}$$

$$10.5$$