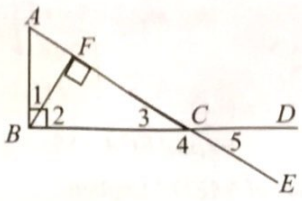
Honors Geometry
Midterm Supplement Review

Name: Answer Key

For numbers 1 – 3, use the diagram.



1. Name a pair of numbered angles that are supplementary.
∠3 and ∠4 ; ∠4 and ∠5
2. Name a pair of numbered angles that are vertical.
∠3 and ∠5
3. How many angles have their vertex at A? (1)

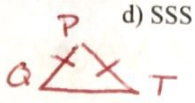
4. A triangle with 3 congruent angles is called equiangular

5. Which of the following is not a method for proving triangles congruent?

a) ASA b) SAS (c) AAA d) SSS e) HL

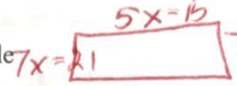
Talk about

6. If the legs of an isosceles triangle $\overline{PQ}$ and $\overline{TP}$, name the base.



base = QT

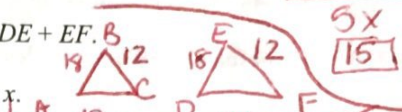
7. The sides of a rectangle are in a ratio of 5:7 and the perimeter is 72. Find the area of the rectangle.



5x = 15
7x = 21
24x = 72
x = 3
A = 15(21)
= 315

Area = 315 u²

8. $\Delta ABC \cong \Delta DEF$, $DF = 10$, $AB = 18$, and the perimeter of ΔABC is 40. Find $DE + EF$.



DE + EF = 18 + 12 = 30u

9. If the sides of a triangle are 6, 8, and x, find the range of possible values for x.

2 < x < 14 * Assume smallest then largest side

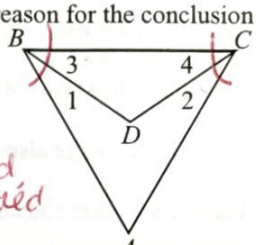
10. True or False: The supplement of an angle is larger than the complement.

True → S = 180 − x C = 90 − x

11. True of False: Vertical angles can be supplementary.

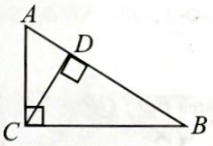
TRUE → if they are 90° / ⊥ lines

12. Given $\angle ABC \cong \angle ACB$, $\overline{BD}$ bisects $\angle ABC$, $\overline{CD}$ bisects $\angle ACB$, give the reason for the conclusion of $\angle 3 \cong \angle 4$.



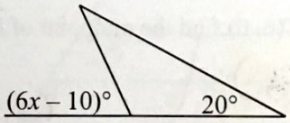
Statements	Reasons
① ∠ABC ≅ ∠ACB, BD bisect ∠ABC, CD bisects ∠ACB	① Given
② ∠1 ≅ ∠3, ∠2 ≅ ∠4	② If an angle is bisected then the angle is divided into 2 ≅ ∠'s.
③ ∠3 ≅ ∠4	③ If 2 ∠'s are ≅, then their like divisions are ≅.

13. Given $\angle A$ is complementary to $\angle ACD$, $\angle BCD$ is complementary to $\angle ACD$, give the reason for the conclusion of $\angle A \cong \angle BCD$.



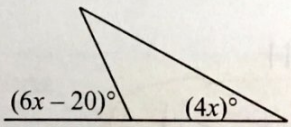
If 2 ∠'s are comp. to the same ∠, then they are ≅.

14. Write a valid inequality of the restrictions on x.



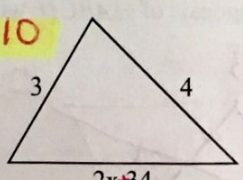
6x − 10 > 20
6x > 30
x > 5

15. Write a valid inequality of the restrictions on x.



6x − 20 > 4x
−20 > −2x
10 < x or x > 10

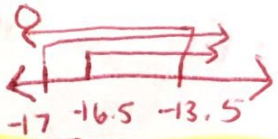
16. Find the restrictions on the value of x.



Assume smallest
2x + 34 + 3 > 4
2x + 37 > 4
2x > −33
x > −16.5

Assume largest
3 + 4 > 2x + 34
7 > 2x + 34
−27 > 2x
−13.5 > x

Side is larger than Q
2x + 34 > 0
2x > −34
x > −17



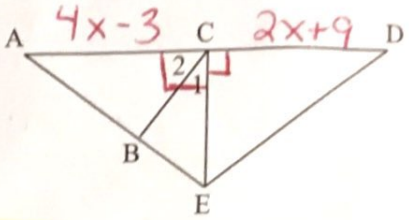
−16.5 < x < −13.5

For numbers 17 & 18, use the figure on the right.

17. If $\overline{EC}$ is an altitude of ΔAED, $m\angle 1 = 2x+7$, and $m\angle 2 = 3x+13$, find $m\angle 1$ and $m\angle 2$.

$2x+7+3x+13=90$
$5x+20=90$
$5x=70$ $x=14$

$m\angle 1 = 35°$
$m\angle 2 = 55°$



18. Find the value of x if $AC = 4x-3, DC = 2x+9, m\angle ECA = 15x+2$ and $\overline{EC}$ is a median of ΔAED. Is $\overline{EC}$ also an altitude of ΔAED? Explain.

$4x-3=2x+9$
$2x=12$
$x=6$

$m\angle ECA = 15(6)+2 = 92°$
EC is not an altitude because $\angle ECA$ does not measure to be 90°.

For numbers 19 – 29, write **A** for always, **S** for sometimes or **N** for never.

19. The diagonals of a trapezoid bisect each other. Never

20. If a triangle is equilateral, then it is equiangular. Always

21. If a quadrilateral is equilateral, then it is equiangular. Sometimes

22. The perpendicular bisector of the base of an isosceles triangle bisects the vertex angle. Always

23. The measure of an exterior angle of a triangle is greater than every angle of the triangle. Sometimes

24. The acute angles of a scalene right triangle are congruent. Never

25. If the sum of two angle is obtuse, then both are obtuse. Never

26. In isosceles ΔABC, we can conclude that $AB = BC$. Sometimes - depends on the base.

27. In isosceles ΔABC, we can conclude that at least two of the angles are congruent. Always

28. In isosceles ΔABC, the bisector of the vertex angle also bisects the base. Always

29. If the diagonals of quadrilateral bisect each other and also bisect the angles, then the quadrilateral is a square.

Sometimes - could just be a rhombus

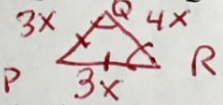
30. The measures of two consecutive angles of a parallelogram have a ratio of 11:1. Find the measure of the larger angle.

$11x+1x=180$
$12x=180$
$x=15$

$11(15)=165$

measure of the larger $\angle = 165°$

31. The perimeter of ΔPQR is 42, $\angle Q \cong \angle R$, and $PQ : QR = 3:4$. Find QR.

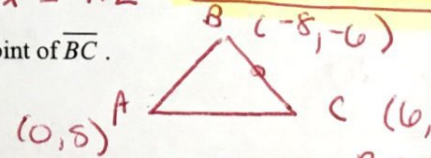


$10x=42$
$x=4.2$

$QR = 16.8$ u

32. Given ΔABC with $A(0, 8)$, $B(-8, -6)$, and $C(6, 0)$ find the midpoint of $\overline{BC}$.

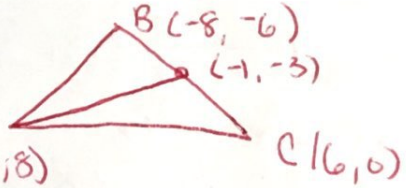
$\left(\frac{-8+6}{2}, \frac{-6+0}{2}\right) = (-1, -3)$



33. Given ΔABC with $A(0, 8)$, $B(-8, -6)$, and $C(6, 0)$ find the slope of the median to $\overline{BC}$.

$m = \frac{-3-8}{-1-0} = \frac{-11}{-1} = 11$

slope = 11



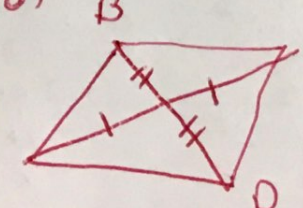
34. Find the coordinates of the intersection of the diagonals of $\square ABCD$ with the given vertices. $A(3, 6)$, $B(5, 8)$, $C(3, -2)$, and $D(1, -4)$

(5, 8)

* Find midpoint to show bisects

Intersection: (3, 2)

(3, 6)



C (3, -2)

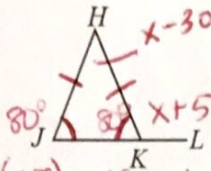
$mp_{BD} = \left(\frac{5+1}{2}, \frac{8+-4}{2}\right)$

(3, 2)

$mp_{AC} = \left(\frac{3+3}{2}, \frac{6+-2}{2}\right) = (3, 2)$

35. $\overline{HJ} \cong \overline{HK}$, $m\angle HKL = (x + 50)°$, $m\angle H = (x - 30)°$. Find the $m\angle H$.

$m\angle H = 20°$



$x - 30 = 20$

$x + 50 = 100$

$180 - (x+50)$ $180 - (x+50)$

$180 = x - 30 + 180 - (x+50) + 180 - (x+50)$

$180 = x - 30 + 180 - x - 50 + 180 - x - 50$

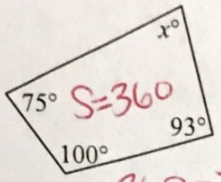
$180 = 230 - x$

$-50 = -x$

$x = 50$

For numbers 36 – 38, find the value of x.

36.

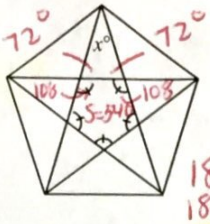


$S = 360$

$360 - 75 - 100 - 93 = x$

$92 = x$

37.



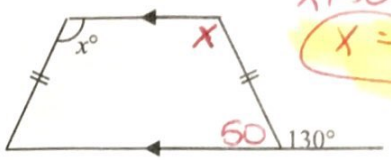
$\frac{540}{5} = 108$

$180 - 108 = 72°$

$180 - 72 - 72 = x$

$x = 36$

38.



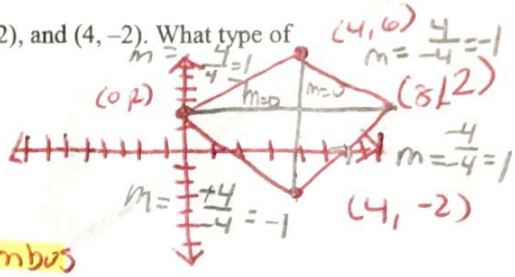
$x + 50 = 180$

$x = 130$

39. On a coordinate plane, the four corners of Ronald's garden are located at (0, 2), (4, 6), (8, 2), and (4, –2). What type of quadrilateral most accurately describes the shape of Ronald's garden?

use coordinate Grid

✓ Parallelogram < rect, rhombus > square



40. Write the most descriptive name for each figure.

a) A four-sided figure in which the diagonals are perpendicular bisectors of each other. rhombus

b) A four-sided figure in which the diagonals bisect each other. parallelogram

c) A triangle in which there is a hypotenuse. right triangle

d) A four-sided figure in which the diagonals are congruent and all sides are congruent. Square

41. Write A for always, S for sometimes, or N for never.

a) If a triangle is obtuse, it is isosceles. Sometimes

b) The bisector of the vertex angle of a scalene triangle is perpendicular to the base. Never

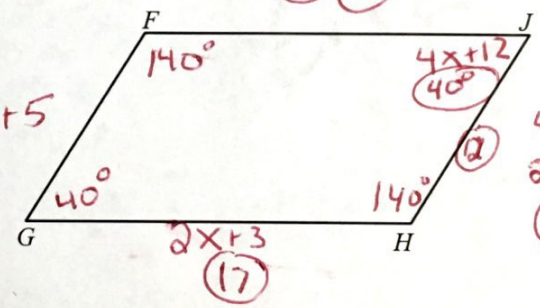
c) If one of the diagonals of a quadrilateral is the perpendicular bisector of the other, the quadrilateral is a kite. Sometimes - square too.

42. Given: $FGHJ$ is a $\square$.
$FG = x + 5$, $GH = 2x + 3$
$m\angle G = 40°$, $m\angle J = (4x + 12)°$
Find: a) $m\angle F$.

$m\angle F = 140°$

b) The perimeter of $FGHJ$.

perimeter = 58 u



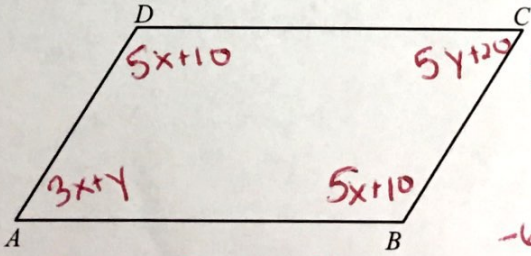
$40 = 4x + 12$

$28 = 4x$

$7 = x$

43. Given: $ABCD$ is a $\square$.
$m\angle A = (3x + y)°$
$m\angle D = (5x + 10)°$
$m\angle C = (5y + 20)°$
Find $m\angle B$.

$m\angle B = 110°$



$5x + 10 + 5x + 10 + 5y + 20 + 3x + y = 360$

$13x + 6y + 40 = 360$

$\begin{cases} 13x + 6y = 320 \\ 8x + y = 170 \end{cases}$ $-6 \cdot$

$13x + 6y = 320$

$-48x - 6y = -1020$

$-35x = -700$

$x = 20$

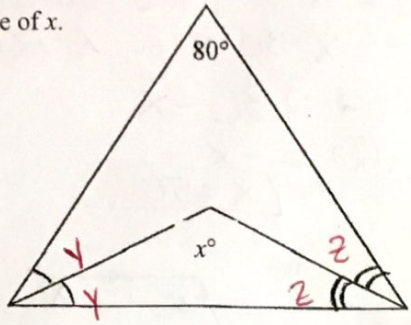
$5x + 10 + 3x + y = 180$

$8x + y = 170$

$160 + y = 170$

$y = 10$

44. Find the value of x.



$\frac{2y}{2} + \frac{2z}{2} = \frac{100}{2}$

$y + z = 50$

$180 - 50 = x$

$130 = x$

45. Given: $\overline{FJ}$ is the base of an isosceles Δ.
$m\angle OHF \cong m\angle KGJ$
O is the midpoint of $\overline{MF}$
K is the midpoint of $\overline{MJ}$
Prove: $\overline{FG} \cong \overline{HJ}$

Statements	Reasons
1. $\overline{FJ}$ is the base of an isosceles Δ.	1. Given
2. $\overline{MF} \cong \overline{MJ}$	2. If a Δ is isos., then 2 sides are $\cong$
3. $m\angle F \cong m\angle J$	3. If 2 sides of a Δ are $\cong$, then the $\angle$s opp the sides are $\cong$
4. O is the midpoint of $\overline{MF}$	4. Given
5. K is the midpoint of $\overline{MJ}$	5. Given
6. $\overline{MO} \cong \overline{OF}$	6. If a pt is the MP, then it divides the seg. into 2 $\cong$ segs
7. $\overline{MK} \cong \overline{KJ}$	7. If a pt is the MP, then it divides the seg. into 2 $\cong$ segs.
8. $\overline{OF} \cong \overline{KJ}$	8. If 2 segs are $\cong$, then their like divisions are $\cong$.
9. $m\angle OHF \cong m\angle KGJ$	9. Given
10. $\Delta OHF \cong \Delta KGJ$	10. AAS
11. $\overline{GH} \cong \overline{GH}$	11. Reflexive
12. $\overline{FG} \cong \overline{HJ}$	12.

DO NOT DO.