Name Schlansky
Mr. Schlansky

Date _____
Geometry

Triangles/Parallel Lines Cut By a Transversal
Regents Review

1. In ΔABC, $m\angle A = 3x + 1$, $m\angle B = 4x - 17$, and $m\angle C = 5x - 20$. Which type of triangle is ΔABC?

1) right
2) scalene
3) ~~isosceles~~
4) equilateral

$3x+1+4x-17+5x-20=180$
$12x-36=180$
$+36 \quad +36$
$\frac{12x}{12}=\frac{216}{12}$
$x=18$

$3(18)+1 = 55$
$4(18)-17 = 55$
$5(18)-20 = 70$

2. Triangle PQR has angles in the ratio of 2:3:5. Which type of triangle is ΔPQR?

1) acute
2) isosceles
3) obtuse
4) ~~right~~

$2x+3x+5x=180$
$\frac{10x}{10}=\frac{180}{10}$
$x=18$

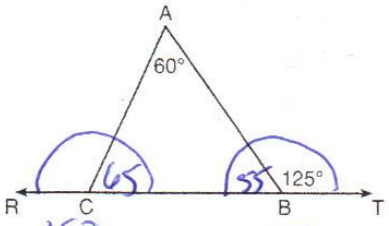
$2(18)=36$
$3(18)=54$
$5(18)=90$

3. In the diagram below, $\overleftrightarrow{RCBT}$ and ΔABC are shown with $m\angle A = 60$ and $m\angle ABT = 125$.

What is $m\angle ACR$?

1) 125
2) ~~115~~
3) 65
4) 55

$55+60+x=180$
$115+x=180$
$-115 \quad -115$
$x=65$



$180-65=115$
$180-125=55$

Look for linear pairs/ angles of a triangle

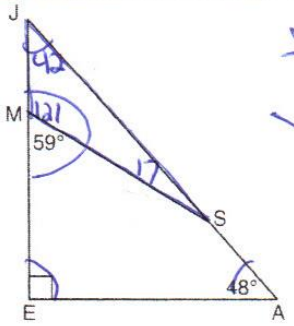
4. In the diagram of ΔJEA below, $m\angle JEA = 90$ and $m\angle EAJ = 48$. Line segment MS connects points M and S on the triangle, such that $m\angle EMS = 59$.

What is $m\angle JSM$?

1) 163
2) 121
3) 42
4) ~~17~~

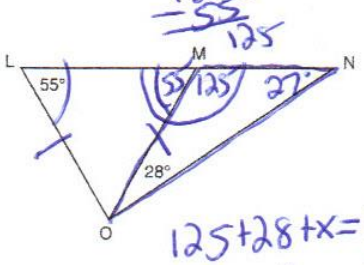
$90+48+x=180$
$138+x=180$
$-138 \quad -138$
$x=42$

$180-59=121$



$42+121+x=180$
$163+x=180$
$-163 \quad -163$
$x=17$

5. In the diagram below, $\triangle LMO$ is isosceles with $LO = MO$.



If $m\angle L = 55$ and $m\angle NOM = 28$, what is $m\angle N$?

1) 27
2) 28
3) 42
4) 70

$180 - 55 = 125$

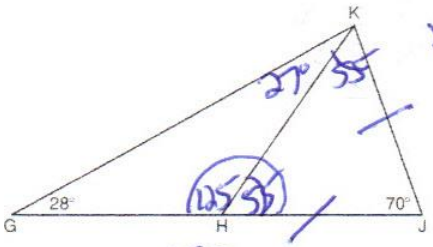
$125 + 28 + x = 180$

$153 + x = 180$

$-153 \quad -153$

$x = 27$

6. In the diagram below of $\triangle GJK$, H is a point on $\overline{GJ}$, $\overline{HJ} \cong \overline{JK}$, $m\angle G = 28$, and $m\angle GJK = 70$. Determine whether $\triangle GHK$ is an isosceles triangle and justify your answer.



$x + x + 70 = 180$

$2x + 70 = 180$

$-70 \quad -70$

$\frac{2x}{2} = \frac{110}{2}$

$x = 55$

$125 + 28 + x = 180$

$153 + x = 180$

$-153 \quad -153$

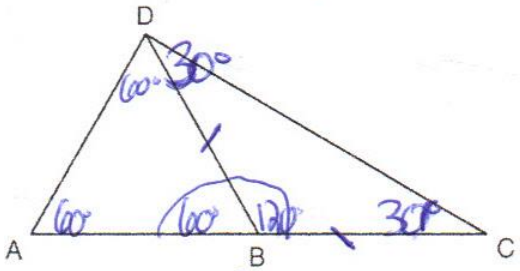
$x = 27$

No, it is scalene.

$180 - 55 = 125$

7. In the diagram below of $\triangle ACD$, B is a point on $\overline{AC}$ such that $\triangle ADB$ is an equilateral triangle, and $\triangle DBC$ is an isosceles triangle with $\overline{DB} \cong \overline{BC}$. Find $m\angle C$.

60, 60, 60



$180 - 60 = 120$

$120 + x + x = 180$

$120 + 2x = 180$

$-120 \quad -120$

$\frac{2x}{2} = \frac{60}{2}$

$x = 30°$

$m\angle C = 30°$

non-right angles: short words, always in. right angles: long words, acute: in, right: on, obtuse: out

8. Fill in the boxes with "inside" or "outside" or "on"

vowel → vowel
consonant → consonant

	Point of Concurrency	Acute	Right	Obtuse
Intersection of Altitudes	orthocenter	in	on	out
Intersection of Medians	Centroid	in	in	in
Intersection of Perpendicular Bisectors	Circumcenter	in	on	out
Intersection of Angle Bisectors	incenter	in	in	in

9. For a triangle, which two points of concurrence could be located outside the triangle?

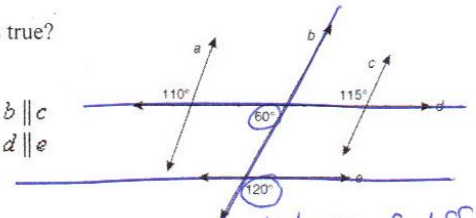
right angle ones
long words

1) incenter and centroid
2) centroid and orthocenter
3) incenter and circumcenter
4) circumcenter and orthocenter

10. In which triangle do the three altitudes intersect outside the triangle?

1) a right triangle
2) an acute triangle
3) an obtuse triangle
4) an equilateral triangle

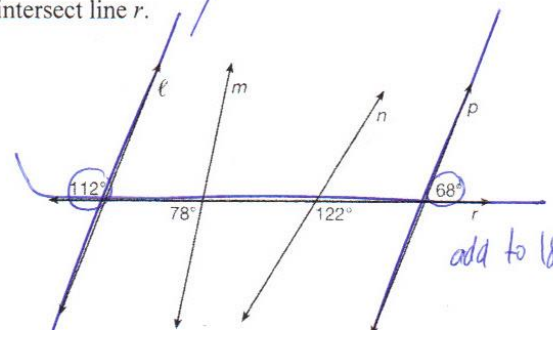
11. Based on the diagram below, which statement is true?



1) $a \parallel b$
2) $a \parallel c$
3) $b \parallel c$
4) $d \parallel e$

add to 180 if different

12. In the diagram below, lines ℓ, m, n, and p intersect line r.

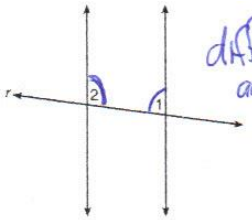


Which statement is true?

1) $\ell \parallel n$
2) $\ell \parallel p$
3) $m \parallel p$
4) $m \parallel n$

add to 180:

13. Lines p and q are intersected by line r, as shown below.



different adds to 180

If $m\angle 1 = 7x - 36$ and $m\angle 2 = 5x + 12$, for which value of x would $p \parallel q$?

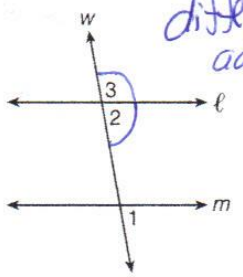
1) 17
2) 24
3) 83
4) 97

$7x-36+5x+12=180$ $\frac{12x}{12}=\frac{204}{12}$

$12x-24=180$ $x=17$

$+24 \quad +24$

14. In the diagram below, line ℓ is parallel to line m, and line w is a transversal.



(Not drawn to scale)

different adds to 18

If $m\angle 2 = 3x + 17$ and $m\angle 3 = 5x - 21$, what is $m\angle 1$?

1) 19
2) 23
3) 74
4) 86

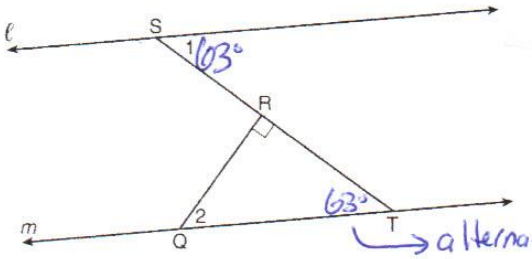
$3x+17+5x-21=180$ $x=23$

$8x-4=180$

$+4 \quad +4$

$\frac{8x}{8}=\frac{184}{8}$

15. In the diagram below, $\ell \parallel m$ and $\overline{QR} \perp \overline{ST}$ at R.



alternate interior angles

$90+63+x=180$

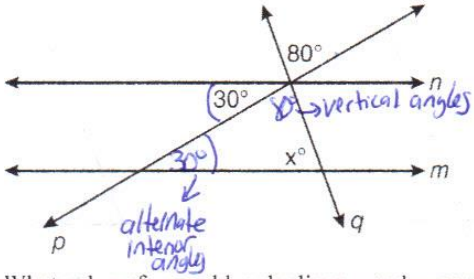
$153+x=180$

$-153 \quad -153$

$x=27$

If $m\angle 1 = 63$, find $m\angle 2$. Explain how you arrived at your answer.

16. In the diagram below, lines n and m are cut by transversals p and q.



$30+80+x=180$

$110+x=180$

$-110 \quad -110$

$x=70°$

What value of x would make lines n and m parallel? Explain why that value would make the lines parallel.

If the lines are parallel, alternate interior angles are congruent.