Geometry Accelerated Name: Solutions
Practice Final Problems & Study Guide

A.M.D.G.

Final Exam Standards (Fill in the rest on your own)

1c	Use the Segment Addition Postulate to solve for missing segment lengths
1d	
1e	
1j	
1n	
3a	
3b	
3f	
3h	
3n	
3o	
5a	
5b	
5c	
5e	
5h	
5i	
5j	
5k	
5l	

To maximize your understanding and success on the fall final exam:

1. **Review all your quizzes and tests from this semester.**
2. **Do the practice problems below.**
3. **Enlist help from classmates, teachers, relatives, etc.**
4. **Redo HW problems from topics you feel less confident with.**
5. **Do some Study Guide Review problems from the end of each chapter in the book**

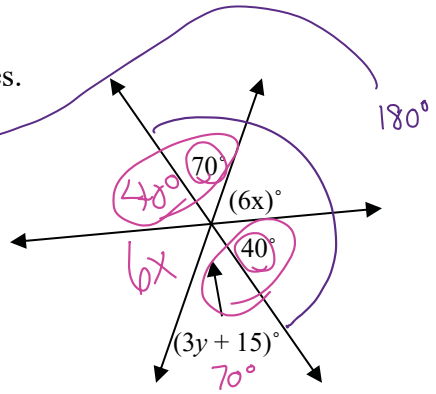
1. Which of the following is a line parallel to the line $5x+3y=15$?

[A] $y=-5x+16$ [B] $y=\frac{5}{3}x+16$ [C] $y=\frac{3}{5}x+16$ [D] $y=-\frac{3}{5}x+16$ [E] $y=-\frac{5}{3}x+16$

Convert to slope-intercept: $3y=-5x+15 \Rightarrow y=-\frac{5}{3}x+5$

↑ slope

2. Find the value of the variables.



$70 + 6x + 40 = 180°$

$6x + 110 = 180$

$6x = 70$

$x = \frac{70}{6}$

$x = \frac{35}{3}$

Vertical Angles

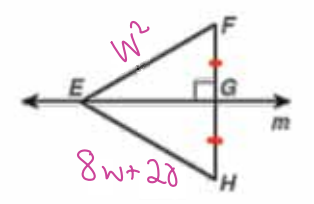
$3y + 15 = 70$

$3y = 55$

$y = \frac{55}{3}$

3. Solve for all variables.

a) If $EF = w^2$ and $EH = 8w + 20$, find the value(s) of w.



$w^2 = 8w + 20$

$w^2 - 8w - 20 = 0$

$(w - 10)(w + 2) = 0$

$w = -2, 10$

$w = -2$

$w^2 = 4$

$8(-2) + 20$

$-16 + 20$

$EF = EH = 4$

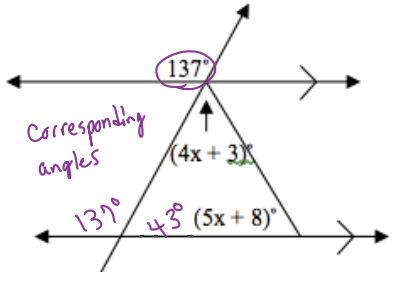
$w = 10$

$w^2 = 100$

$8(10) + 20$

$EF = EH = 100$

b)



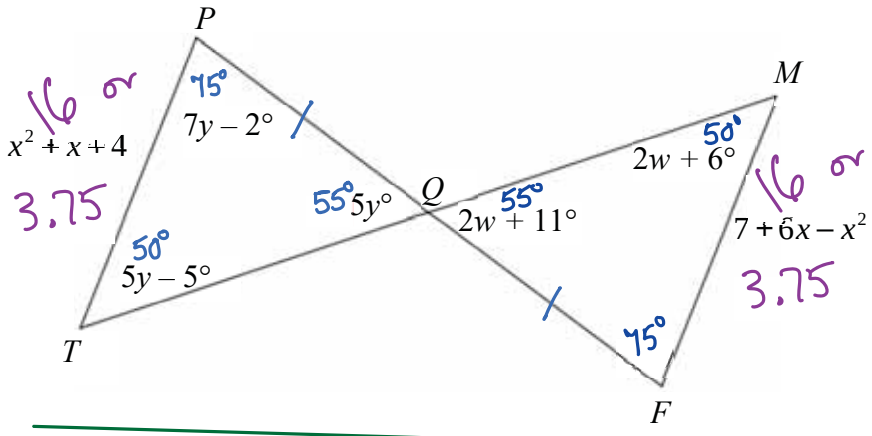
$4x + 3 + 5x + 8 + 43 = 180$ ← Triangle Sum Thm

$-43 \quad -43$

$4x + 3 + 5x + 8 = 137°$

$x = 14$

4. Given Q is the midpoint of $\overline{PF}$, find the values of w and y and use the results to prove $\Delta PQT \cong \Delta FQM$. Then use your proof to solve for x and find PT and FM.



Solve for y

$7y-2+5y+5y-5=180°$

$17y=187$

$y=11$

$m\angle P = 7(11)-2 = 75°$

$m\angle T = 5(11)-5 = 50°$

$m\angle PQT = 5(11) = 55°$

Solve for w

$m\angle MQF = 2w+11 = 55°$ (Vertical Angles)

$2w = 44$

$w = 22$

$m\angle M = 2(22)+6 = 50°$

1) $\overline{QT} \cong \overline{Qm}$	1) Def of midpt.
2) $\angle P \cong \angle F$ $\angle T \cong \angle m$	2) Algebra or Definition of Angle Congruence
If you use ASA → $\angle PQT \cong \angle FQm$	Vertical $\angle$'s
3) $\Delta PQT \cong \Delta FQM$	3) ASA / AAS

$\overline{PT} \cong \overline{FM}$ → CPCTC

$x^2+x+4 = 7+6x-x^2$

$2x^2-5x-3=0$

$2x^2-6x+1x-3=0$

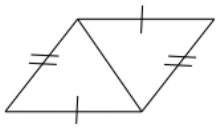
$2x(x-3)+1(x-3)=0$

$(2x+1)(x-3)=0$

$x = -\frac{1}{2}, 3$

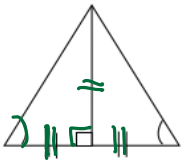
5. For each of the problems below, determine whether or not you can prove the triangles congruent. If you can, which congruence postulate/theorem you would use to prove congruence. Make sure you mark the diagram to demonstrate which parts you are using in your congruence statement.

a)



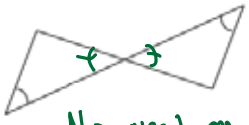
SSS

b)



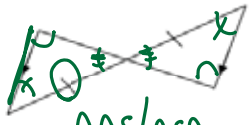
SAS ASA HL

c)



No, need one side

d)



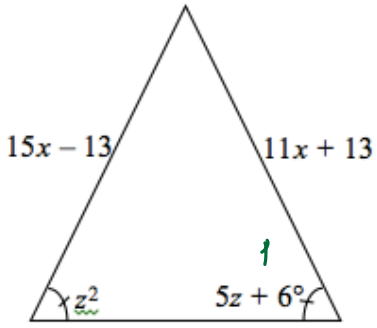
AAS/ASA

e)

SSA not a thing

6. In the diagrams below, solve for x, y and z.

a) Isosceles △



$z^2 = 5z + 6$

$z^2 - 5z - 6 = 0$

$(z-6)(z+1) = 0$

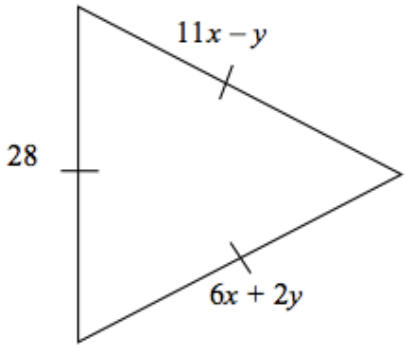
$z = -1, 6$ ← Both work

$15x - 13 = 11x + 13$

$4x = 26$

$x = \frac{13}{2}$

b) Equilateral △



$11x - y = 28$

$6x + 2y = 28$

$2(11x - y = 28)$

$6x + 2y = 28$

$22x - 2y = 56$

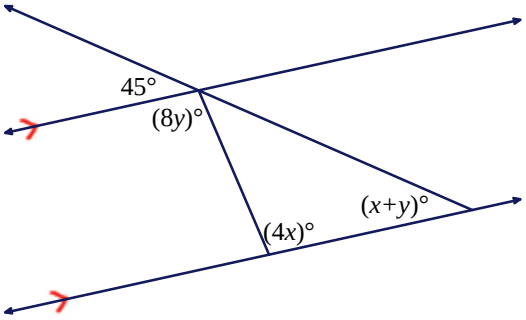
$6x + 2y = 28$

$28x = 84$

$x = 3$

$y = 5$

7. Solve for x and y.



$x+y=45$

$8y=4x \Rightarrow x=2y$ } Alternate Interior ∠'s

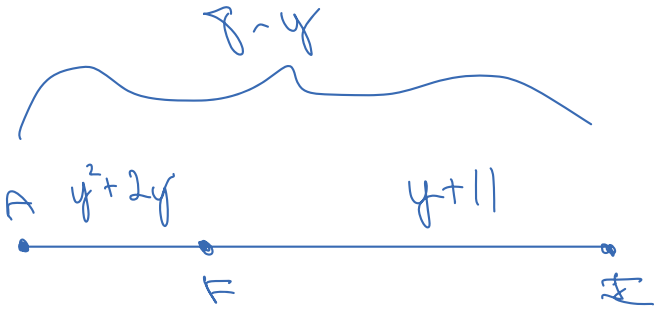
$2y+y=45$

$3y=45$ $x=30^\circ$

$y=15^\circ$

8. Given that F is a point on $\overline{AI}$, $AF = y^2 + 2y$, $FI = y + 11$, and $AI = 8 - y$, sketch the situation. Then find all possible values for y, AF, FI, and AI assuming that all measures are in inches. Name the postulate that allows you to set up this problem.

segment addition



AF + FI = AI

$y^2+2y+y+11=8-y$

$y^2+4y+3=0$

$(y+3)(y+1)=0$

$y=-1,-3$

$y=-3 \rightarrow AF=(-3)^2+2(-3)=9-6=3$

$FI=-3+11=8$

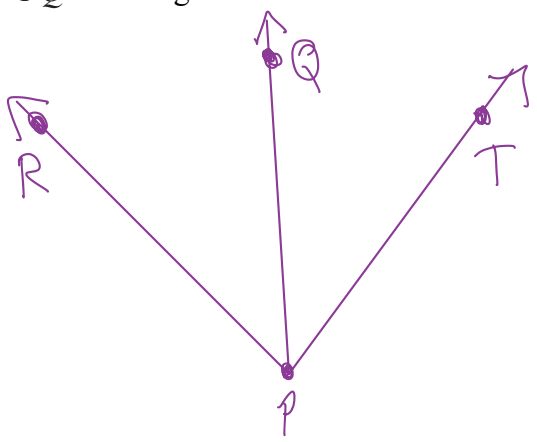
$AI=3+8=11$

$AF=y^2+2y$

$=(-1)^2+2(-1)$

$=1-2=-1$

9. Given $m\angle RPT = 82°$, $m\angle RPQ = 2x^2 - 16x + 23$, and $m\angle QPT = 29 - 12x$, if $\overrightarrow{PQ}$ divides $\angle RPT$ into $\angle RPQ$ and $\angle QPT$ solve for x and determine whether $\overrightarrow{PQ}$ is an angle bisector. Sketch the situation below.



Angle Addition Postulate says that

$2x^2 - 16x + 23 + 29 - 12x = 82°$

$2x^2 - 28x - 30 = 0$

$x^2 - 14x - 15 = 0$

$(x-15)(x+1) = 0$

$x = -1, 15$

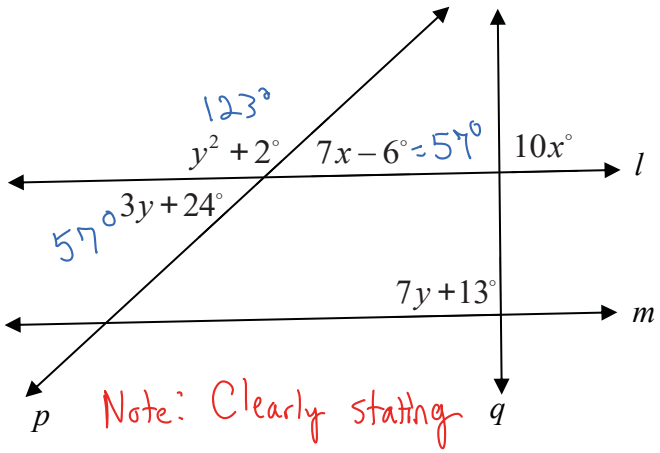
does not work $m\angle QPT < 0$

$\overrightarrow{QP}$ is an angle bisector

$x = -1$ $m\angle RPQ = 2(-1)^2 - 16(-1) + 23 = 41°$

$m\angle QPT = 29 - 12(-1) = 41°$

10. Given the diagram below, solve for x and y. Name the theorem or postulate that allows you to set up your initial equation for each of these. Use your solutions to prove that $l \parallel m$



Linear Pair and Vertical Angles

$7x - 9 = 57$

$7x = 66$

$x = \frac{66}{7}$

Linear Pair

$y^2 + 2 + 3y + 24 = 180$

$y^2 + 3y - 154 = 0$

$(y+14)(y-11) = 0$

$y = -14, 11$

test $y = -14$ on $3y + 24$ to show that it is not a solution

Note: Clearly stating angle relationships in your set up helps if you make an algebra mistake while solving

11. Find the equation of the line passing through the points (–3, –5) and (4, 8). Then find the equation of the lines parallel and perpendicular to that line that passes through the point (–2, 1).

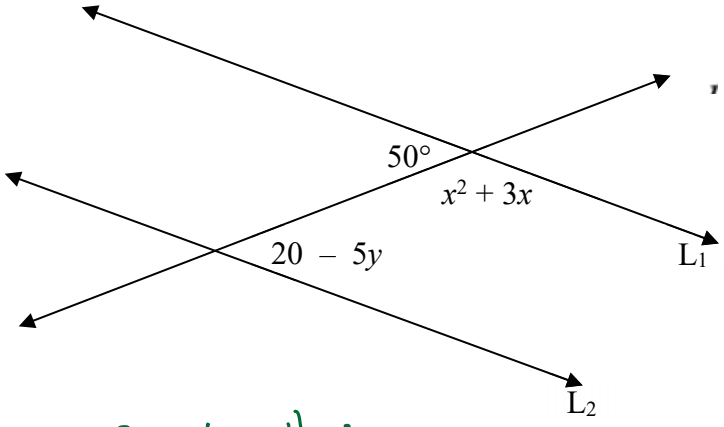
First line: $m = \frac{8-(-5)}{4-(-3)} = \frac{13}{7} \Rightarrow y+5 = \frac{13}{7}(x+3)$ or $y-8 = \frac{13}{7}(x-4)$

Second line: passes through $(-2, 1)$

parallel means slope $= \frac{13}{7}$ $\quad y-1 = \frac{13}{7}(x+2)$

perpendicular means slope $= -\frac{7}{13}$ $\quad y-1 = -\frac{7}{13}(x+2)$

12. Find all values of x and y that will make $L_1 \parallel L_2$.



$x^2 + 3x + 50 = 180$ Linear Pair

$x^2 + 3x - 130 = 0$

$(x+13)(x-10) = 0$

$x = -13, 10$

Both work

$(-13)^2 + 3(-3) = 130^\circ$

$10^2 + 3(10) = 130^\circ$

If $L_1 \parallel L_2$

$20 - 5y = 50^\circ$ Alt Int Angles

$-5y = 30$

$y = -6$