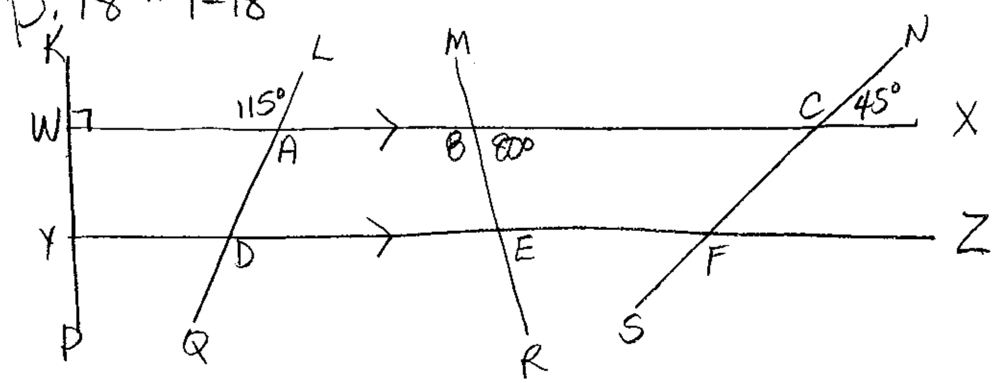
Foundations of Math 11

2.2

P.78 #1–18

1.



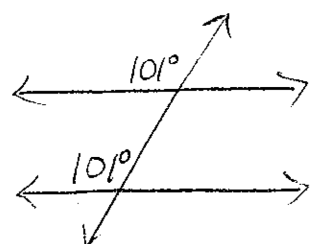
$\angle WYD = 90°$ because it is corresponding to the 90° angle at W

$\angle YDA = 115°$ because it is corresponding to the 115° angle at A

$\angle DEB = 80°$ because it is alternate interior to the 80° angle at B

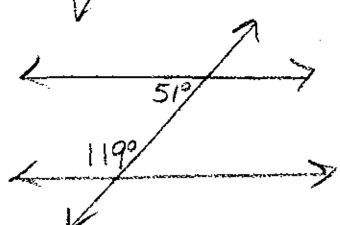
$\angle EFS = 45°$ because it is alternate exterior to the 45° angle at C

2. a)



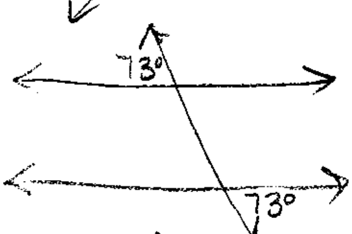
the corresponding angles are equal (both 101°)
parallel

b)



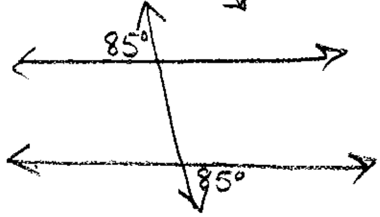
$51° + 119° = 170°$ interior angles on the same side of the transversal should add to 180° - not parallel

c)



the alternate exterior angles are equal (both 73°)
parallel

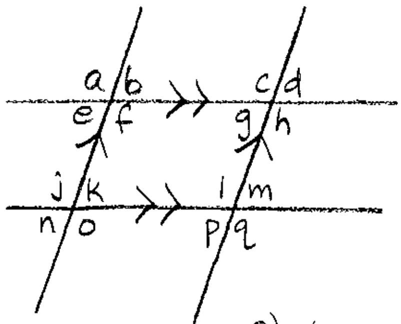
d)



the alternate exterior angles are equal (both 85°)
parallel

p.78 cont.

3.



a) $\angle k = \angle p$ alternate interior $\angle$'s

b) $\angle a = \angle j$ corresponding $\angle$'s

c) $\angle j = \angle q$ alternate exterior $\angle$'s

d) $\angle g = \angle d$ vertically opposite $\angle$'s

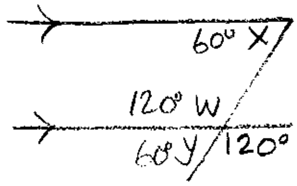
e) $\angle b = \angle m$ $\angle b = \angle d$ corresponding $\angle$'s
$\angle d = \angle m$ corresponding $\angle$'s

f) $\angle e = \angle p$ $\angle e = \angle n$ corresponding $\angle$'s
$\angle n = \angle p$ corresponding $\angle$'s

g) $\angle n = \angle d$ $\angle n = \angle m$ alternate exterior $\angle$'s
$\angle m = \angle d$ corresponding $\angle$'s

h) $\angle f + \angle k = 180°$ interior angles on the same side of transversal

4. a)

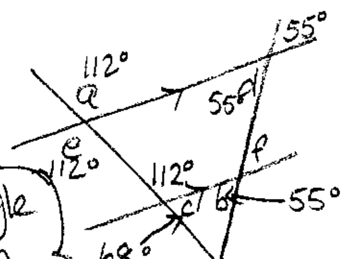


$\angle y = 60°$ $\angle y + 120° = 180°$

$\angle w = 120°$ vertically opposite to 120°

$\angle x = 60°$ corresponding to $\angle y$

b)



Write angle sizes on diagrams as you get them!

$\angle a = 112°$ corresponding to 112°

$\angle b = 55°$ alternate exterior to 55°

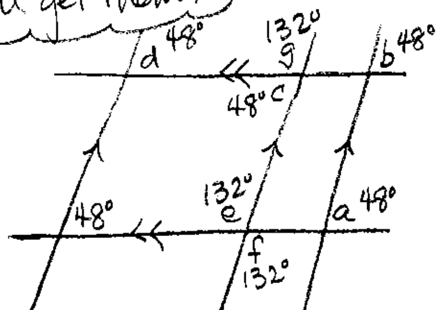
$\angle c = 68°$ supplementary to 112°

$\angle d = 55°$ vertically opposite to 55°

$\angle e = 112°$ vertically opposite to $\angle a$

$\angle f = 55°$ corresponding to 112°

c)



$\angle a = 48°$ corresponding to 48°

$\angle b = 48°$ corresponding to $\angle a$

$\angle c = 48°$ alternate exterior to $\angle b$

$\angle d = 48°$ corresponding 48° (and $\angle b$)

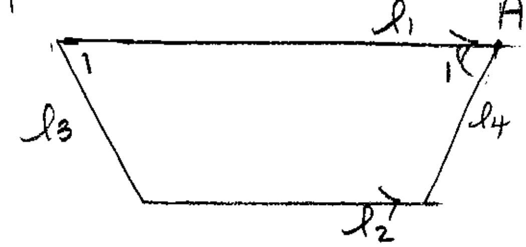
$\angle e = 132°$ interior $\angle$'s on same side of transversal to 48°

$\angle f = 132°$ vertically opposite $\angle e$

$\angle g = 132°$ corresponding to $\angle e$

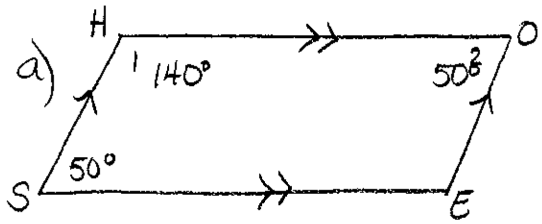
p.78 cont.

5.



① Draw parallel lines of unequal length (l_1 and l_2)
② Join one end of each line together (l_3)
③ Measure ∠1 where l_1 meets l_3
④ Follow l_2 for some distance to point A
⑤ Measure same angle as ∠1 from l_1 towards l_2
⑥ Join point A and measure point to create l_4

6. a)

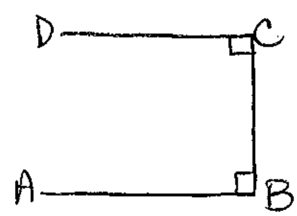


b) $\angle 1 = 140°$ interior ∠'s on same side of transversal to 50°

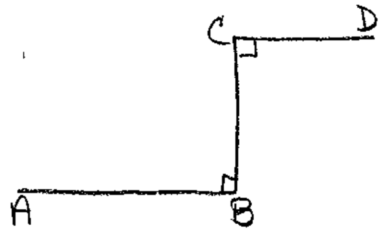
$\angle 2 = 50°$ interior ∠'s on same side of transversal to 140°

7. Look at the patterns in the picture.

8. a)



or



Use a diagram to understand the situation

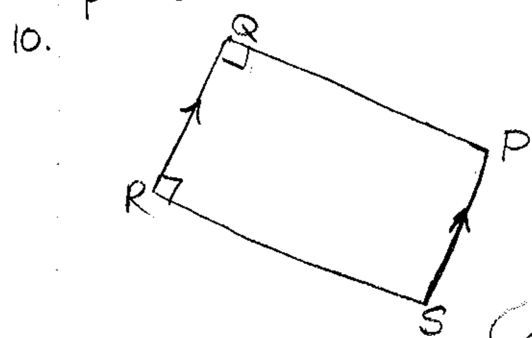
The transitive property works for things that are equal, not thing that are perpendicular.

b) A better conjecture:
If $AB \perp BC$ and $BC \perp CD$ then $AB \parallel CD$

9. Check the angles between the vertical pieces and the diagonal trusses and compare.

p. 78 cont.

10.



Given: $QP \perp QR$
$QR \perp RS$
$QR \parallel PS$

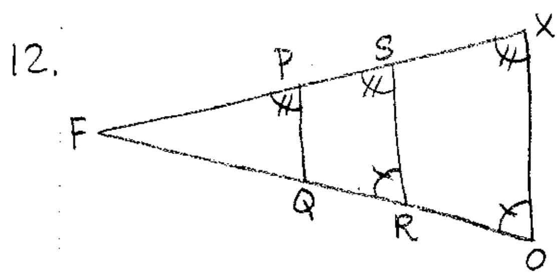
Prove: QPSR is a parallelogram

So, I need to show $QP \parallel RS$

Statement	Justification
$QP \perp QR$, $QR \perp RS$	given
$\angle PQR = 90°$, $\angle QRS = 90°$	definition of perpendicular
$\angle PQR + \angle QRS = 180°$	$90° + 90° = 180°$
$QP \parallel RS$	interior $\angle$'s same side of transversal
$QR \parallel PS$	given
QPSR is a parallelogram	two sets of parallel sides

11. Look at picture for ideas.

12.



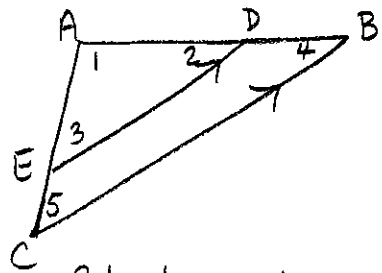
Given: $\triangle FOX$ is isosceles
$\angle FOX = \angle FRS$
$\angle FXO = \angle FPQ$

Prove: $PQ \parallel SR$ and $SR \parallel XO$

Statement	Justification
$\angle FOX = \angle FRS$	given
$SR \parallel XO$	corresponding $\angle$'s are equal
$\angle FXO = \angle FPQ$	given
$PQ \parallel XO$	corresponding $\angle$'s are equal
$\angle FXO = \angle FSR$	$SR \parallel XO$, corresponding $\angle$'s are equal
$\angle FPQ = \angle FSR$	transitive property, both $= \angle FXO$
$PQ \parallel SR$	corresponding $\angle$'s are equal

P.78 cont.

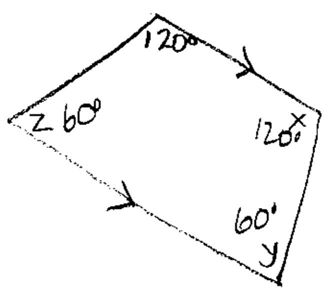
13. a)



b) Similar triangles have all the same size angles but do not have to have all the same side lengths.

Statement	Justification
DE ∥ BC	given
∠2 = ∠4	corresponding ∠'s
∠3 = ∠5	corresponding ∠'s
∠1 = ∠1	the same ∠ in both triangles
△ ADE is similar to △ ABC	all angles are equal

14. a)



isosceles trapezoid has 2 parallel sides

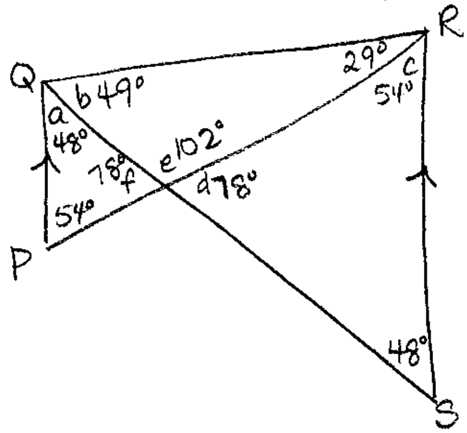
x = 120° isosceles - same as 120°

y = 60° interior same side of transversal to ∠x

z = 60° interior same side of transversal to 120°

b) An isoceles trapezoid will have two pairs of equal angles adjacent to each other.

15.



∠c = 54° alternate interior to 54°

∠a = 48° alternate interior to 48°

∠b = 49° angle sum of △ is 180°

180° - 54° - 29° - 48° = 49°

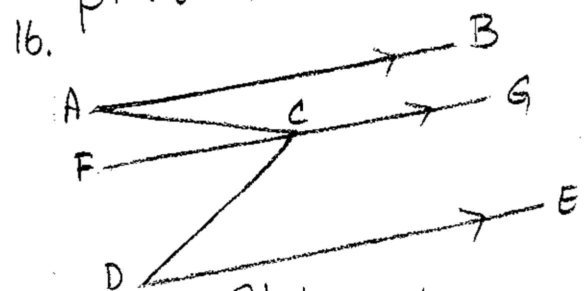
∠f = 78° angle sum of △ is 180°

∠d = 78° vertically opposite to ∠f

∠e = 102° supplementary to ∠f

p. 78 cont.

16.

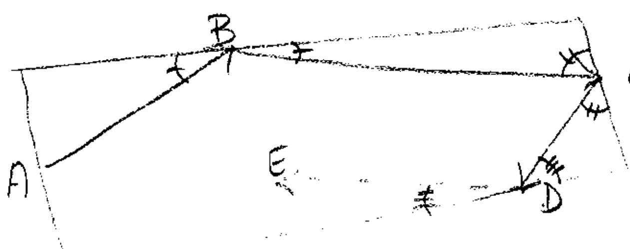


Given: AB ∥ DE
DE ∥ FG

Show: ∠ACD = ∠BAC + ∠CDE

Statement	Justification
AB ∥ DE and DE ∥ FG	given
∠BAC = ∠ACF	alternate interior angles
∠CDE = ∠FCD	alternate interior angle
∠ACF + ∠FCD = ∠ACD	adding angles
∠BAC + ∠CDE = ∠ACD	adding equivalent angles

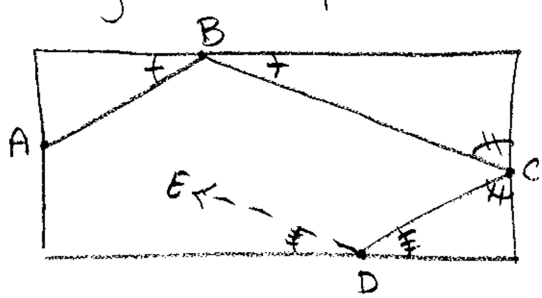
17.



pool table

a) Every second path will be parallel. eg. AB ∥ CD, BC ∥ DE

b)

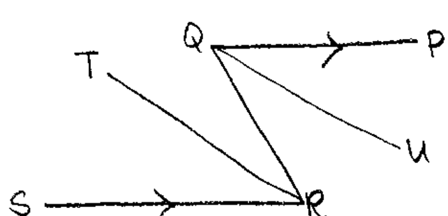


c) AB ∥ CD, BC ∥ DE

d) Yes the pattern will continue

bisect means to divide into 2 equal parts

18.



Given: QP ∥ SR
RT bisects ∠QRS
QU bisects ∠PQR

Prove: QU ∥ RT

Statement	Justification
QP ∥ SR	given
RT bisects ∠QRS, QU bisects ∠PQR	given
∠PQU = ∠UQR, ∠QRT = ∠TRS	definition of bisect
∠PQR = ∠QRS	alternate interior ∠'s are equal
∠UQR = ∠QRT	½ of equal angles
QU ∥ RT	alternate interior ∠'s are equal