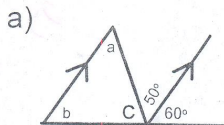Assignment - Angle Properties.pdf

In class Assignment.notebook
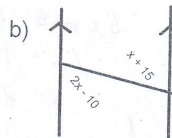
Chapter 7
In class Assignment   Name : _____Key_____

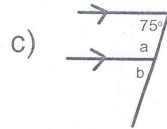1) For each unknown angle, identify the measurement of the angle AND the property you used to solve it:
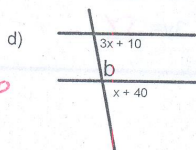
a)

Answers:

c= 70 (SAT)
a= 50° (AIA)
b= 60° (SATT)

b)

Answers:
(AIA)
x= 25
2x -10 = 40°
x + 15 = 40°

2x-10 = x+15
x = 25

c)

Answers:
a=105° (CIA)
b=75° (CA)

d)

·40

Answers: (CA)
x= 15
3x + 10 = 55°
x + 40 = 55°
b= 125° (CIA)

e)
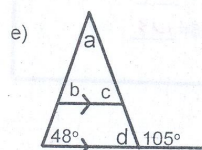
Answers:
d= 75 (SAT)
c = 75 (CA)
b = 48 (CA)
a = 57° (SATT)

f)
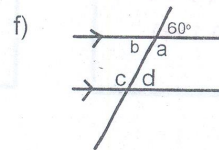
Answers:
a=120° (SAT)
b= 60° (OAT)
c = 120° (AIA)
d= 60° (CA)

g)
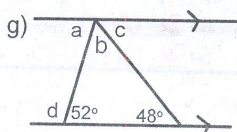
Answers:
a=52° (AIA)
b=80° (SATT)
c = 48° (AIA)
d = 128 (SAT)

h)
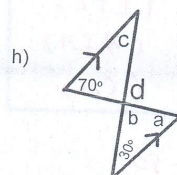
Answers:
a=70° (AIA)
b=80° (SATT)
c = 30° (AIA)
d= 100° (SAT)

i)
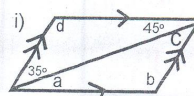
Answers:
a= 45 (AIA)
b= 100° (SATT
c= 35 (AIA)
d= 100° (SATT)

1

$2x+3 + 4x+15 = 180$
$6x+18 = 180$
$6x = 162$
$x = 27$
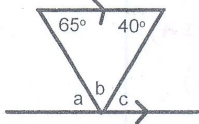
$2y+3y = 90$
$5y = 90$
$y = 18$

j)

65°   40°

a   b   c

Answers:
a = 65° (AIA)
b = 75° (SATT)
c = 40° (AIA)
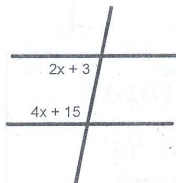
k)

2x + 3

4x + 15

Answers: (CIA)
x = 27°
2x + 3 = 57°
4x + 15 = 103°

l)

2y

3y

Answers: (CAT)
y = 18°
2y = 36°
3y = 54°

m)

z   y

w   x   48°
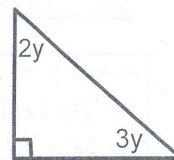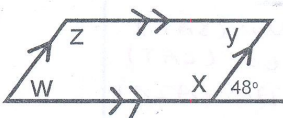
Answers:
x = 132° (SAT)
y = 48° (CIA)
w = 48° (CA)
z = 132° (CIA)

n)

x

w   80°   y   z
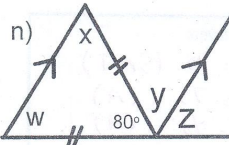
Answers:
w = 50° (ITT)
x = 50° (ITT)
y = 50° (AIA)
z = 50° (CA)

$\dfrac{180 - 80}{2}$

o)

a   5x + 3   3x + 17   b

70°
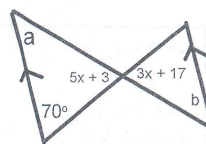
$5x+3 = 3x+17$
$2x = 14$
$x = 7$

Answers:
x = 7 (OAT)
5x + 3 = 38°
3x + 17 = 38°
a = 72° (SATT)
b = 72° (SATT)

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EXAMPLE 2 | Using reasoning to determine unknown angles

Determine the measures of *a*, *b*, *c*, and *d*.
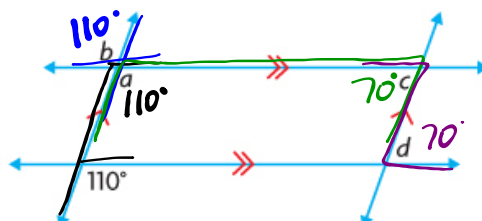
Kebeh's Solution

$\angle a = 110°$

The 110° angle and $\angle a$ are corresponding. Since the lines are parallel, the 110° angle and $\angle a$ are equal.

$\angle a = \angle b$
$\angle b = 110°$

Vertically opposite angles are equal.

$\angle c + \angle a = 180°$
$\angle c + 110° = 180°$
$\angle c = 70°$
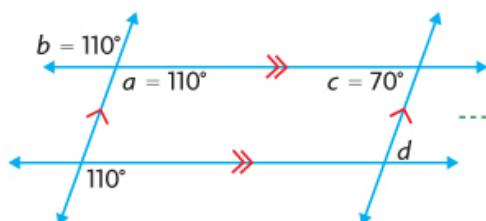
$\angle c$ and $\angle a$ are interior angles on the same side of a transversal. Since the lines are parallel, $\angle c$ and $\angle a$ are supplementary.

I updated the diagram.

$\angle c = \angle d$
$\angle d = 70°$

The measures of the angles are:
$\angle a = 110°; \angle b = 110°;$
$\angle c = 70°; \angle d = 70°.$

$\angle c$ and $\angle d$ are alternate interior angles. Since the lines are parallel, $\angle c$ and $\angle d$ are equal.

EXAMPLE 3 | Using reasoning to solve problems   **JUSTIFY!!!**

Determine the measures of
$\angle NMO$, $\angle MNO$, and $\angle QMO$.

① $\angle MNO = 47°$ (A I A)
① $\angle NMO = 94°$ (SATT)
③ $\angle QMO = 19°$ (SAT)

[Diagram with points L, M, Q along top; angles 67°, ①, ③ 19°, 94°; O on right with 39°; N, P along bottom with 20°; R below N; ② 47°]
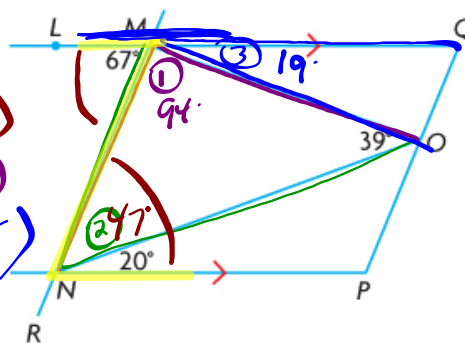
Tyler's Solution

MN is a transversal of parallel lines LQ and NP. ----- (MN intersects parallel lines LQ and NP.)

$\angle MNO + 20° = 67°$
$\qquad \angle MNO = 47°$
-------------- (Since $\angle LMN$ and $\angle MNP$ are alternate interior angles between parallel lines, they are equal.)

$\angle NMO + \angle MNO + 39° = 180°$
$\quad \angle NMO + (47°) + 39° = 180°$
$\qquad\qquad \angle NMO + 86° = 180°$
$\qquad\qquad\qquad \angle NMO = 94°$
-------------- (The measures of the angles in a triangle add to 180°.)

$\angle NMO + \angle QMO + 67° = 180°$
$\quad (94°) + \angle QMO + 67° = 180°$
$\qquad\quad 161° + \angle QMO = 180°$
$\qquad\qquad\qquad \angle QMO = 19°$
-------------- ($\angle LMN$, $\angle NMO$, and $\angle QMO$ form a straight line, so their measures must add to 180°.)

The measures of the angles are:
$\angle MNO = 47°$; $\angle NMO = 94°$; $\angle QMO = 19°$.

Geometric Proofs... The 'Two-Column Proof'

Key Terms (in your notes)...

deductive reasoning

Drawing a specific conclusion through logical reasoning by starting with general assumptions that are known to be valid.

proof

A mathematical argument showing that a statement is valid in all cases, or that no counterexample exists.

transitive property

If two quantities are equal to the same quantity, then they are equal to each other.
If $a = b$ and $b = c$, then $a = c$.

two-column proof

A presentation of a logical argument involving deductive reasoning in which the statements of the argument are written in one column and the justifications for the statements are written in the other column.

STATEMENT | JUSTIFICATION

***ADD this one to your notes...

> ### converse
> A statement that is formed by switching the premise and the conclusion of another statement.

EXAMPLES...

Conjecture: If it is raining outside, then the grass is wet.

CONVERSE: If the grass is wet, then it is raining.

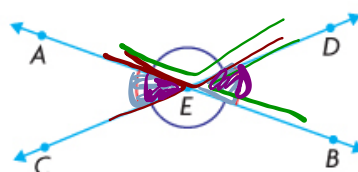**THEOREM:** If you have parallel lines, then the corresponding angles are equal.

CONVERSE: If the corresponding angles are equal, then the lines are parallel.

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EXAMPLE **4**	Using deductive reasoning to prove a geometric conjecture

Prove that when two straight lines intersect, the vertically opposite angles are equal.
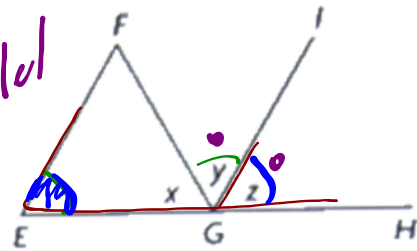

Jose's Solution: Reasoning in a two-column proof

Statement	Justification
$\angle AEC + \angle AED = 180°$	Supplementary angles
$\angle AEC = 180° - \angle AED$	Subtraction property
$\angle BED + \angle AED = 180°$	Supplementary angles
$\angle BED = 180° - \angle AED$	Subtraction property
$\angle AEC = \angle BED$	**Transitive property**

(SAT)

(SAT)

Example #2:

← 2 equal

Parallel

In $\triangle EFG$, GI bisects $\angle FGH$

a) If $\angle E = \angle y$, then prove that $EF \parallel GI$

Statement	Justification
$\angle y = \angle z$	Bisect
$\angle E = \angle y$	Given
$\angle E = \angle z$	Transitive
$EF \parallel GI$	CA

Therefore ∴

In $\triangle EFG$, GI bisects $\angle FGH$

b) If $\angle F = \angle z$, then prove that $EF \parallel GI$
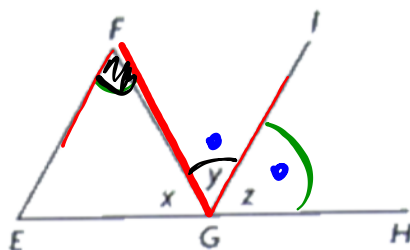
S	J
$\angle y = \angle z$	Bisected
$\angle F = \angle z$	Given
$\angle F = \angle y$	Transitive
$\therefore EF \parallel GI$	AIA

Homework...

p. 72: #2, 4-6

p. 78: #1, 2, 4, 8, 10, 12, 15, 20

Attachments

Assignment - Angle Properties.pdf