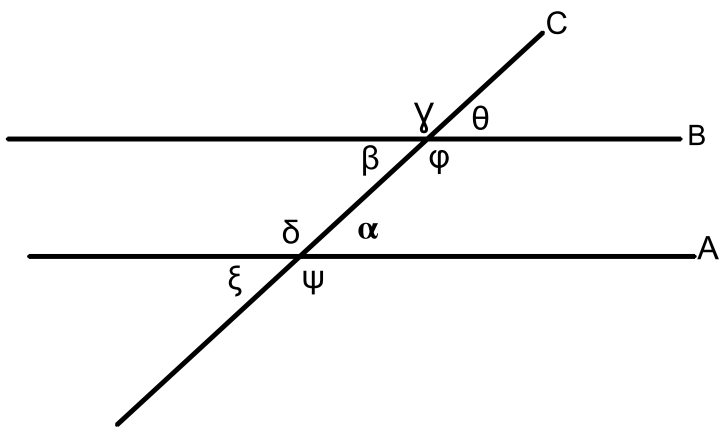
11.4 More About Angles

Lines A and B are parallel, cut by transversal line C.



Name a set of:

vertical angles

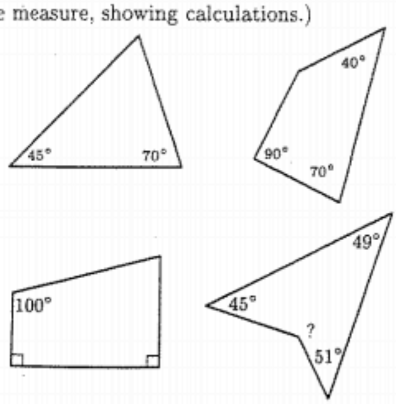
corresponding angles

alternate interior angles

alternate exterior angles

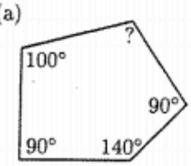
Which angles are congruent?

1. What are the unmarked angles? (Write in the degree measure, showing calculations.)

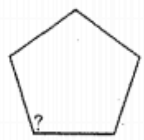


2. Figure out the measure of the unknown angles in the figures below. Show your work.

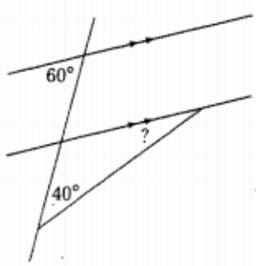
(a)



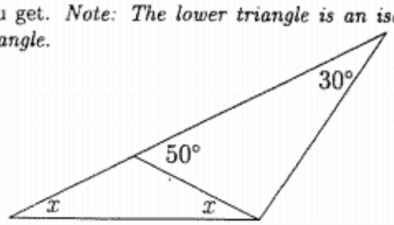
(b) Regular Pentagon



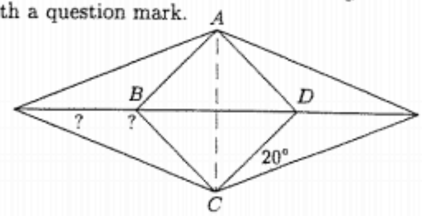
3. What is the measure of the angle marked with a question mark? *Show your reasoning.*



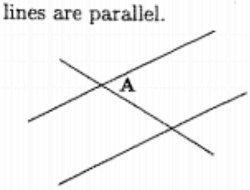
4. There are 4 unknown angles in the figure below. Figure out these angles and write in the values that you get. *Note: The lower triangle is an isosceles triangle.*



5. The quadrilateral $ABCD$ is a square and the dotted line AC is a line of symmetry for the figure below. Work out the value of the angles marked with a question mark.



6. Consider the angle marked **A** in the figure below where two lines are parallel.

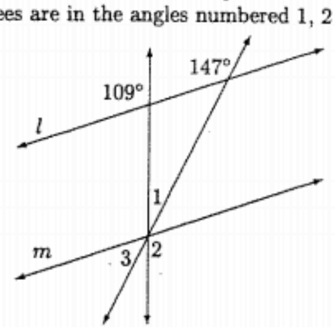


B. Mark with a **B** an angle which is an alternate interior angle to angle **A**.

C. Mark with a **C** an angle which is a corresponding angle to angle **A**.

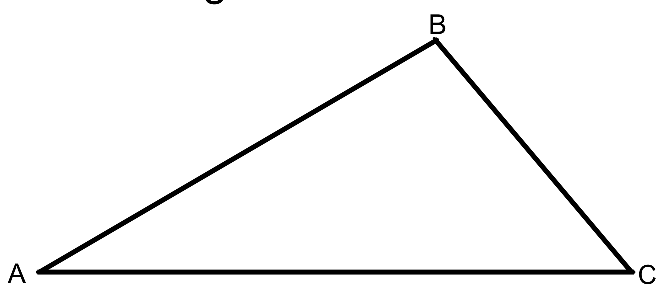
D. Mark with a **D** an angle which is a vertical angle to angle **A**.

7. Lines l and m below are parallel. How many degrees are in the angles numbered 1, 2 and 3?

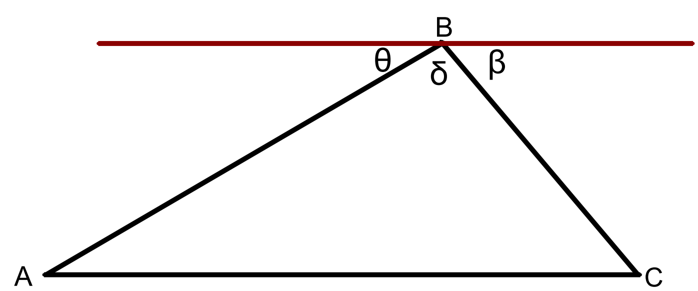


Prove that the three angles of a triangle add up to 180º.

1. Folding

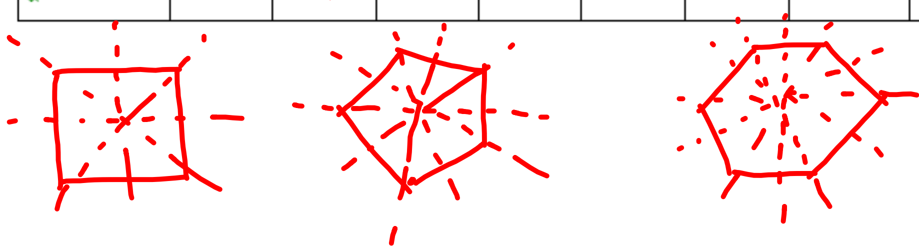


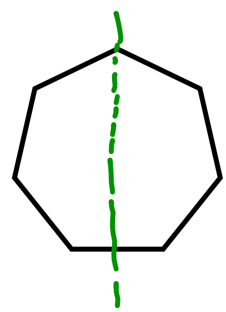
2. proof



REGULAR POLYGONS

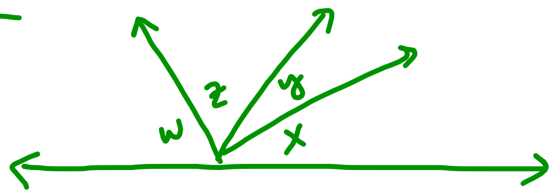
Name ____ sides	Central angle measure	Vertex angle measure	Exterior angle measure	Number of Vertices	Number of Diagonals from one Vertex	Number of Triangles formed.	Total sum of degrees in all interior angles	Vertex angle measures	Lines of symmetry	Angles of symmetry
SQUARE 4 sides	90°	90°	90°	4	1	2	2(180°)= 360°		4	90° (4)
5	$\frac{360°}{5}$	$\frac{3(180°)}{5}$	$\frac{360°}{5}$	5	2	3	3(180°)		5	$\frac{360°}{5}$ (5)
6	$\frac{360°}{6}$	$\frac{4(180°)}{6}$	$\frac{360}{6}$	6	3	4	4(180°)		6	$\frac{360°}{6}$ (6)
7	$\frac{360°}{7}$	$\frac{5(180°)}{7}$	$\frac{360°}{7}$	7	4	5	5(180°)		7	$\frac{360°}{7}$
8	$\frac{360°}{8}$	$\frac{6(180°)}{8}$	$\frac{360°}{8}$	8	5	6	6(180°)		8	$\frac{360°}{8}$
9	$\frac{360°}{9}$	$\frac{7(180°)}{9}$	$\frac{360°}{9}$	9	6	7	7(180°)		9	$\frac{360°}{9}$
10	$\frac{360°}{10}$	$\frac{8(180°)}{10}$	$\frac{360°}{10}$	10	7	8	8(180°)		10	$\frac{360°}{10}$
12	$\frac{360°}{12}$	$\frac{10(180°)}{12}$	$\frac{360°}{12}$	12	9	10	10(180°)		12	$\frac{360°}{12}$
n	$\frac{360°}{n}$	$\frac{180°(n-2)}{n}$	$\frac{360°}{n}$	n	n-3	n-2	180°(n-2)		n	$\frac{360°}{n}$





11.4 HW Qns

A #15



$y = 2x = \frac{1}{2}z = \frac{1}{3}w$

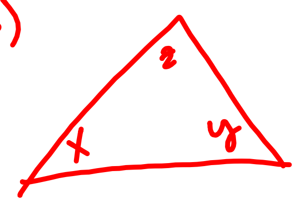
① $y = 2x$
② $2x = \frac{1}{2}z$
③ $2x = \frac{1}{3}w$
④ $w + y + z + x = 180$

① $y = 2x$
② $z = 4x$
③ $w = 6x$
$\Longrightarrow$ ④ $6x + 2x + 4x + x = 180$

$13x = 180$

$x = \frac{180}{13} = 13\frac{11}{13}°$

B #15 (b)



① $\frac{x}{y} = \frac{3}{4}$, ② $\frac{y}{z} = \frac{4}{5}$

③ $x + y + z = 180$

① $x = \frac{3}{4}y$

② $5z\left(\frac{y}{z}\right) = \frac{4}{5}(5z)$

$5y = 4z$

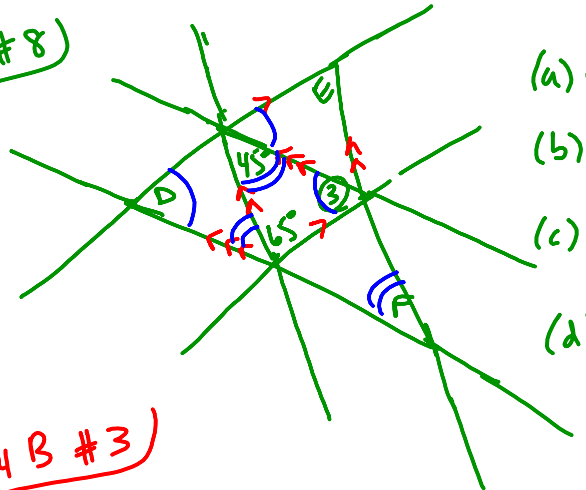
$z = \frac{5}{4}y$

$\Rightarrow$ ③ $\frac{3}{4}y + y + \frac{5}{4}y = 180$

$3y = 180$

$\boxed{y = 60°}$

A#8)



(a) $m\angle 3 = 70°$

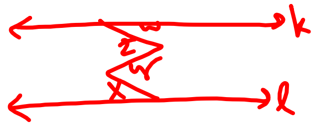
(b) $m\angle D = m\angle 3 = 70°$

(c) $m\angle E = 45°$

(d) $m\angle F = 65°$

11.4 B #3)

(b)

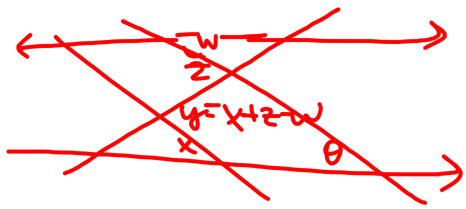


$y = x + z - w$

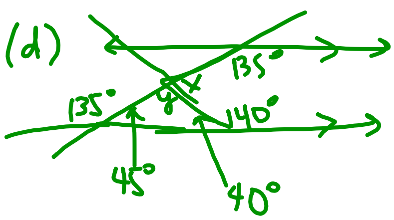
Prove $k \parallel l$

$\Leftrightarrow$ prove alt. int. angle $\cong$

$\Leftrightarrow$ prove $m\angle w = m\angle \theta$



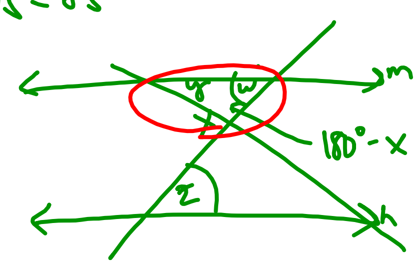
(d)



$y = 180 - 45 - 40 = 95°$

$x = 180 - 95 = 85°$

11.4A #3f



$x = y + z$

scratch

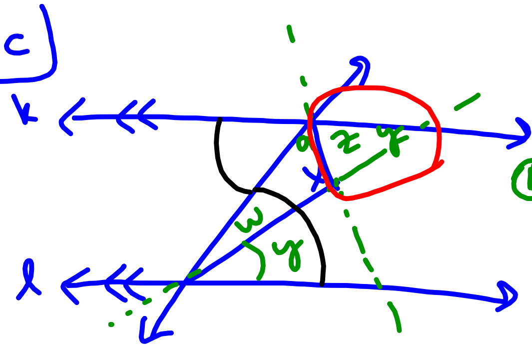
if they are $\parallel$, then $m\angle z = m\angle w$

$\Rightarrow y + w + 180° - x = 180°$

$y + w - x = 0$

$y + w = x \Rightarrow y + z = x$

11.4A #9c



(A) $y = 2w$

$z = 2a$

$z + y + 180 - x = 180$

(1) $z + y = x$

$z + 2w = x$ ★

$180 - a - 3w + 2w = x$

$180 - a - w = x$ ★

$\Rightarrow 2a + 2w = x$

(2) $w + y = 180 - (a + z)$

from (A) $w + 2w = 180 - a - z$

$3w = 180 - a - z$

$z = 180 - a - 3w$

we know $z = 2a$

$180 - a - w = 2a + 2w$

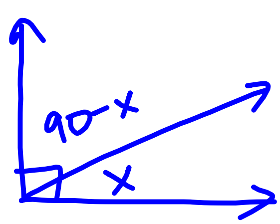
$180 - (a + w) = 2(a + w)$

$180 = 3(a + w)$

$60^\circ = a + w$

$\Rightarrow x = 120^\circ$

11.4B #4a



$x = \frac{2}{3}(90 - x)$

$x = 60 - \frac{2}{3}x$

$\frac{5}{3}x = 60$

$x = 36^\circ$

What is sum of exterior angles for any convex polygon?