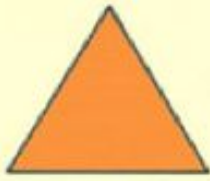## Regular polygons

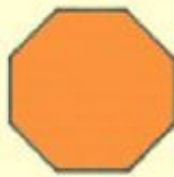Triangle   Quadrilateral   Pentagon   Hexagon
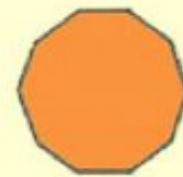
Heptagon   Octagon   Nonagon   Decagon

File Edit View Insert Format Draw Help

Angles in Parallel Lines

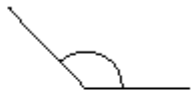Mr Jeffery Maths

Bottom right
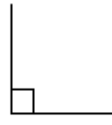
Corresponding angles are the same

Alternate angles are the same

Opposite angles are the same

Angles on a straight line sum to 180°

Acute angle
less than $90°$

Right angle
$= 90°$

Obtuse angle
between $90°$
and $180°$

Straight line
$= 180°$

Reflex angle
greater than
$180°$

Complete turn
$= 360°$

II   y   I

$210°$

x

III   IV
Third quadrant angle
(a)

II   y   I

x

$-260°$

III   IV
Second quadrant angle
(b)

II   y   I

$40°$
x

III   IV
First quadrant angle
(c)

II   y   I

x
$-50°$

III   IV
Fourth quadrant angle
(d)

II   y   I

$270°$

x

III   IV
Quadrant angle
(e)

II   y   I

x

$-180°$

III   IV
Quadrant angle
(f)
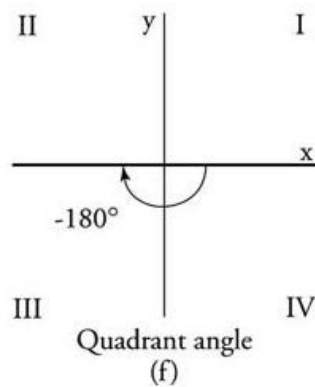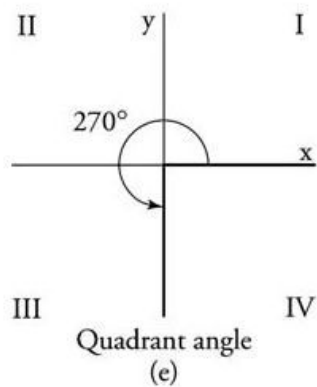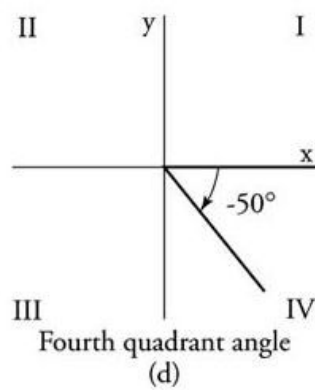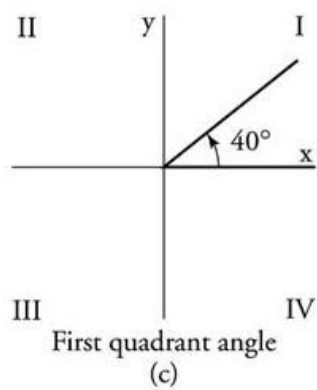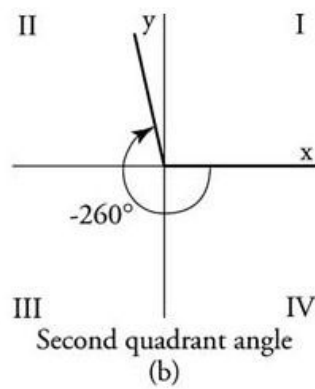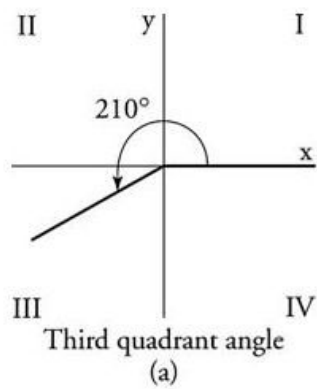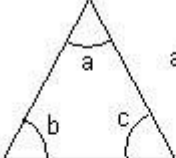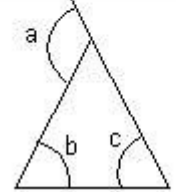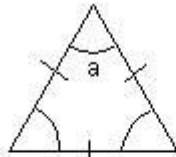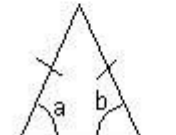
Figure 2
Types of angles.

Interior Angles of a Triangle. The sum of the interior angles of a triangle is 180°.	$a + b + c = 180°$
Exterior Angles of a Triangle. The exterior angle of a triangle is equal to the sum of the 2 interior opposite angles. The exterior angle is obtained by extending one side of the triangle.	$a = b + c$
Equilateral Triangles. An equilateral triangle has all sides equal in length and all angles equal to 60°.	$a = 60°$
Isosceles Triangles. An isosceles triangle has 2 sides of equal length. The base angles are equal.	$a = b$

Trigonometric functions of the angle θ can be constructed geometrically in terms of a unit circle

1.0000"

56.30993°

33.69007°

0.6667"

run

tan

90°

sine

Unit Circle
Radius = 1
Pitch = 8:12
Roof Slope Angle = 33.69007°

33.69007°

56.30993°

line is tangent
to the unit circle

angle θ

cos

Rafter Length = Run ÷ cos(angle θ)
Rafter Length = 1 ÷ 0.8321 = 1.2019
Radius = 12
Rafter Length = 12 ÷ 0.8321 = 14.4228

0.8321"

1.2019"

cos(33.69007°) = 0.8321
sin(33.69007°) = 0.5547
tan(33.69007°) = 0.6667

Rafter Tools