Additional Mathematics Notes (Graphs)

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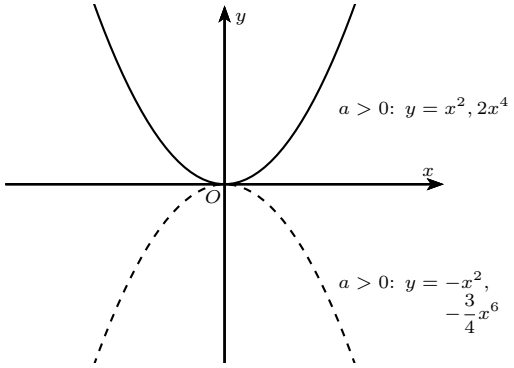
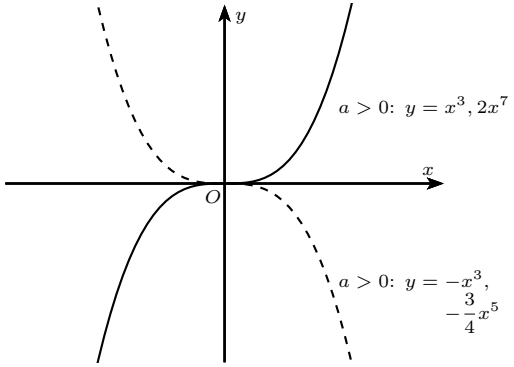
1 Power Functions

Graphs of power functions ($y = ax^n$)

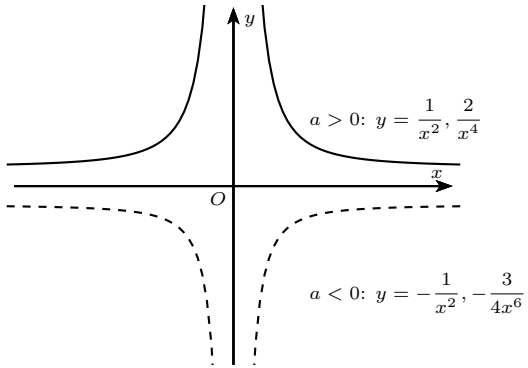
$n = 2, 4, 6, 8, ...$



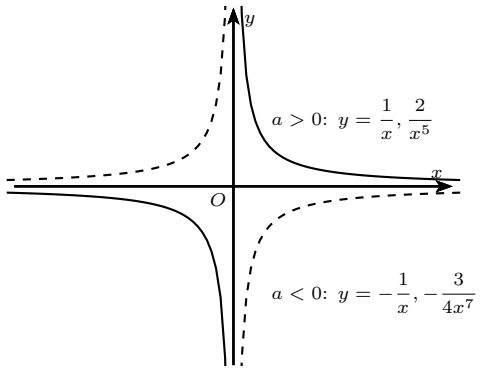
$n = 3, 5, 7, 9, ...$



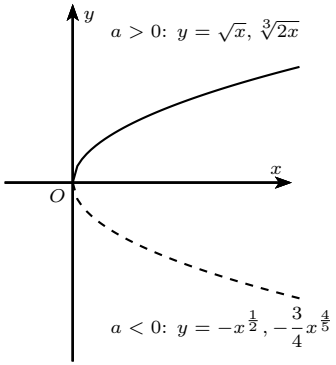
$n = -2, -4, -6, -8, ...$



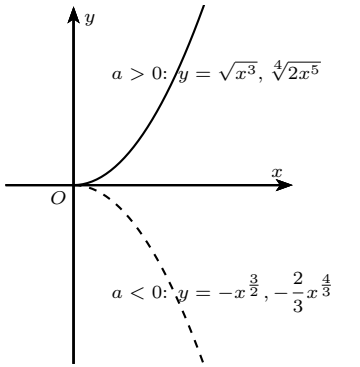
$n = -1, -3, -5, -7, ...$



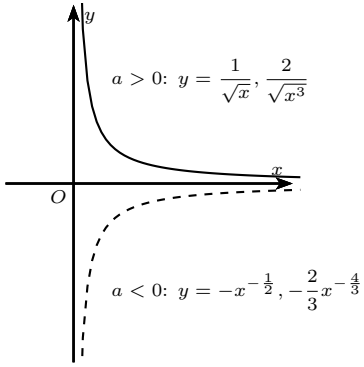
$x > 0, 0 < n < 1$



$x > 0, n > 1$



$x > 0, n < 0$

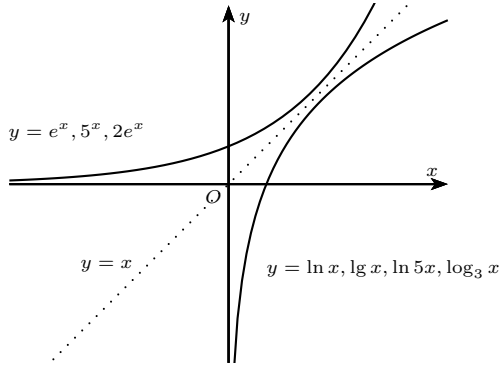


2 Exponential & Logarithmic Function (Graphs)

Graphs of exponential & logarithmic function

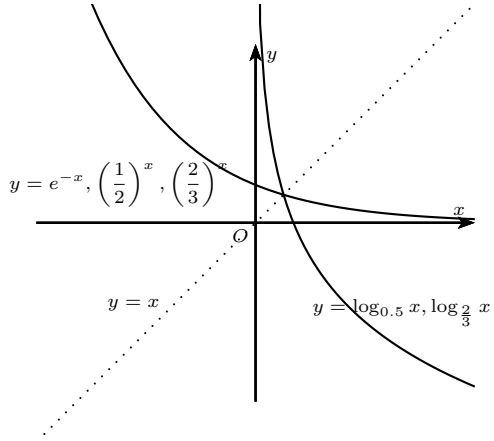
$\boxed{y = e^x, a^x, a > 1}$

$\boxed{y = \ln x, \log_a x, a > 1}$

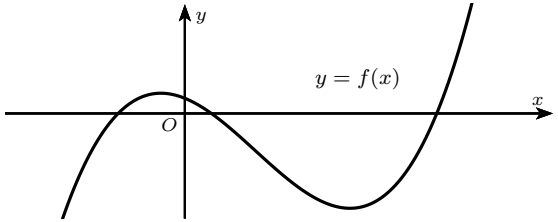


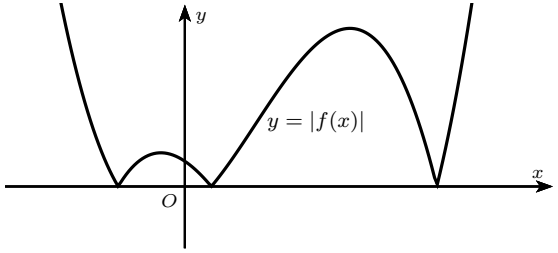
$\boxed{y = e^{-x}, a^x, 0 < a < 1}$

$\boxed{y = \log_a x, 0 < a < 1}$



3 Modulus Functions Graphs

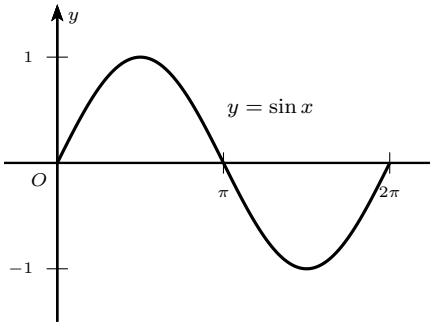




As can be seen, all the negative portions below the x-axis is reflected in the x-axis when the modulus function is applied.

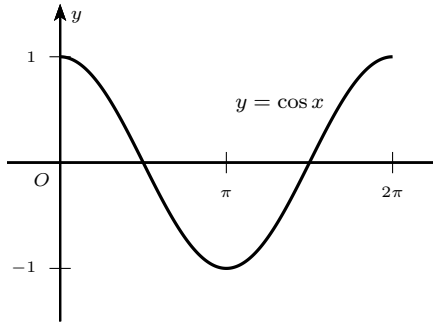
4 Trigonometric Graphs

Sine graph



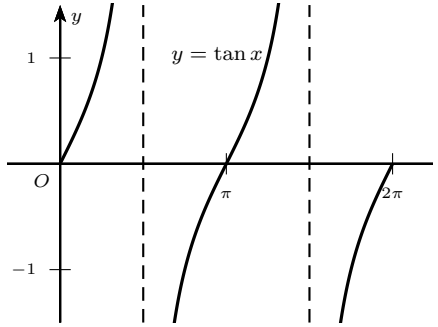
1. amplitude = 1
2. period = 2π

Cosine graph



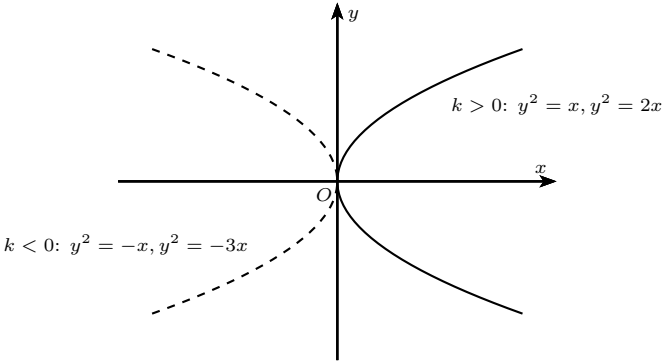
1. amplitude = 1
2. period = 2π

Tangent graph



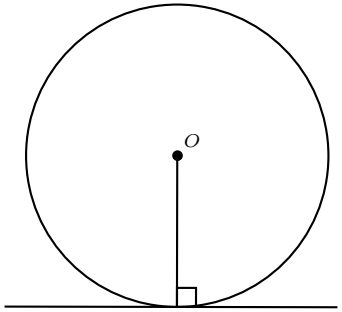
period = π

5 Graphs Of Parabolas ($y^2 = kx$)

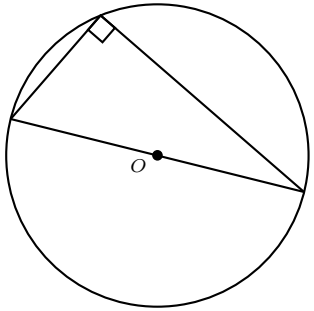


6 Proofs In Plane Geometry

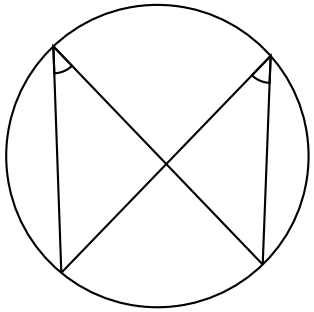
Properties Of Circles



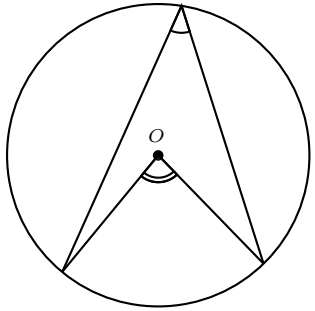
tan. $\perp$ rad.



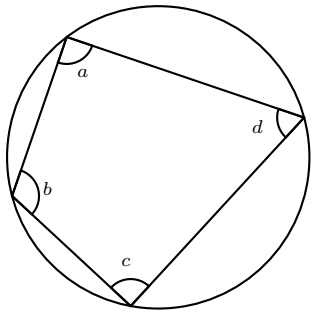
rt. $\angle$ in semicircle



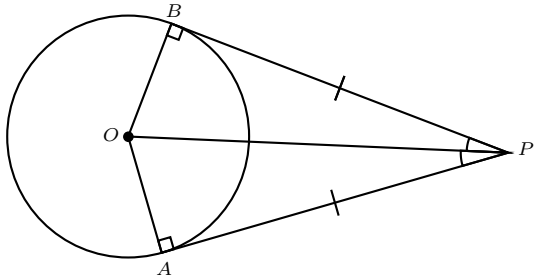
$\angle$s in same seg.



$\angle$ at centre = 2 $\angle$ at circ.



$\angle$s in opp. seg. ($a + c = b + d = 180°$)

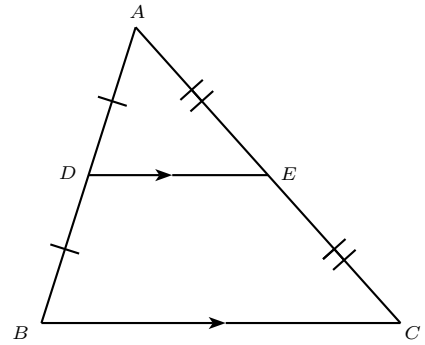


tan. from ext. pt.

Congruent & Similar Triangles

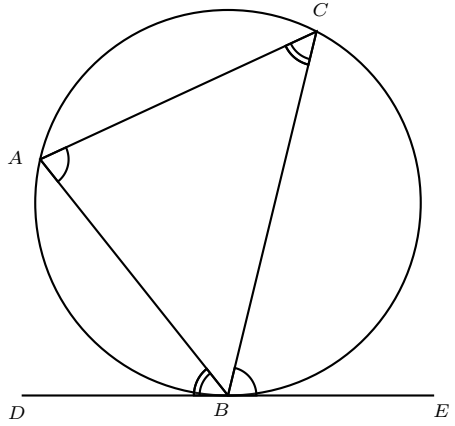
Congruent triangles	Similar triangles
SSS, SAS, AAS, RHS	SSS, SAS, AAA

Midpoint Theorem



If D and E are the midpoints of AB and AC respectively, then $DE \,//\, BC$ and $DE = \frac{1}{2}BC$.

Tangent-Chord Theorem (Alternate Segment Theorem)



If DE is a tangent to the circle at B, then $\angle CAB = \angle CBE$ and $\angle ACB = \angle ABD$.