

Additional Mathematics Notes

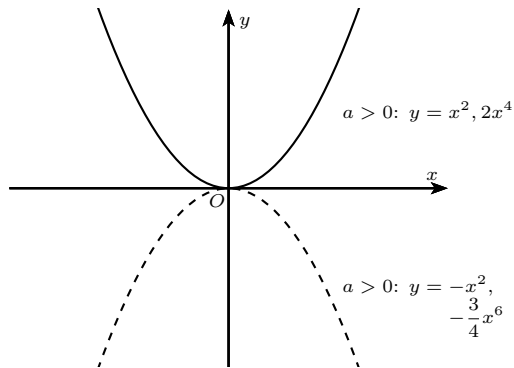
(Graphs)

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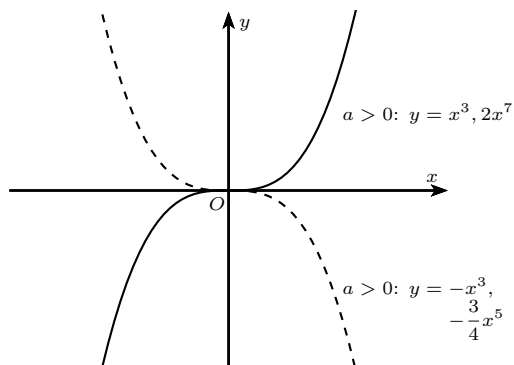
1 Power Functions

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

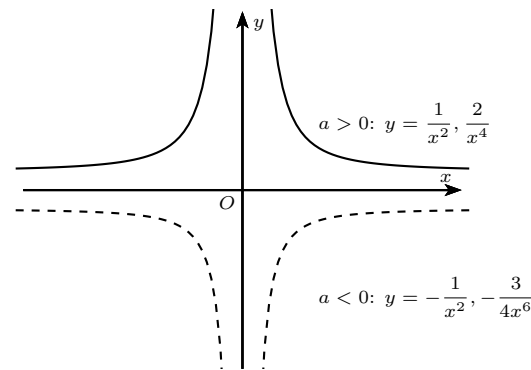
$$n = 2, 4, 6, 8, \dots$$



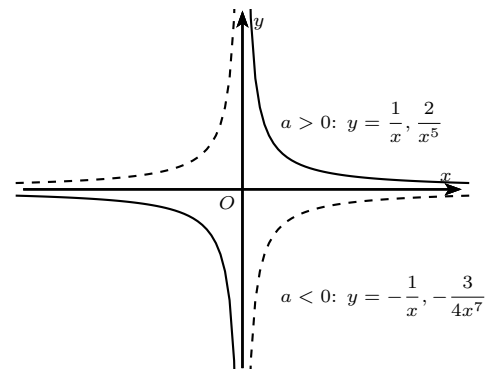
$$n = 3, 5, 7, 9, \dots$$



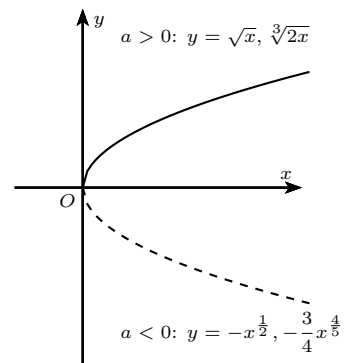
$$n = -2, -4, -6, -8, \dots$$



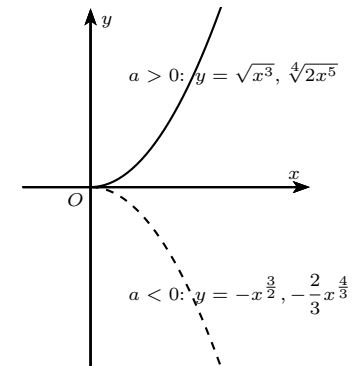
$$n = -1, -3, -5, -7, \dots$$



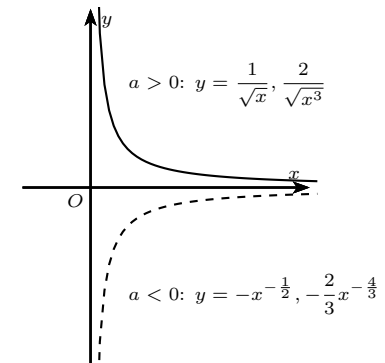
$$x > 0, 0 < n < 1$$



$$x > 0, n > 1$$



$$x > 0, n < 0$$

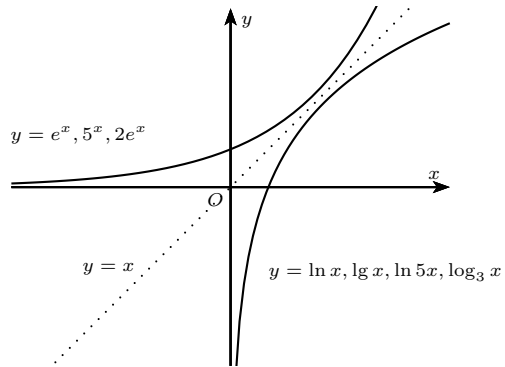


2 Exponential & Logarithmic Function (Graphs)

Graphs of exponential & logarithmic function

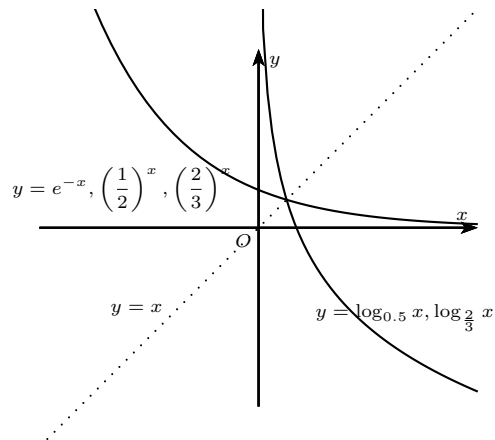
$$y = e^x, a^x, a > 1$$

$$y = \ln x, \log_a x, a > 1$$

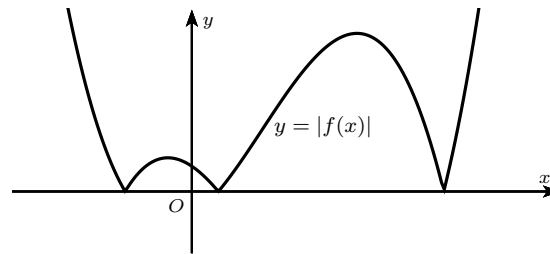
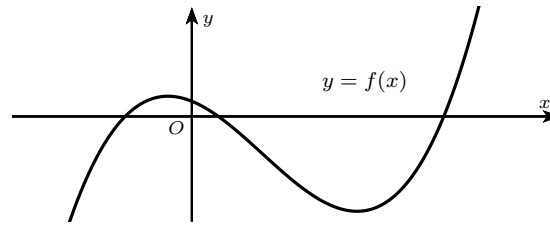


$$y = e^{-x}, a^x, 0 < a < 1$$

$$y = \log_a x, 0 < a < 1$$



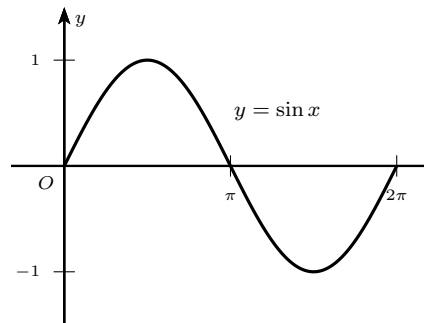
3 Modulus Functions Graphs



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

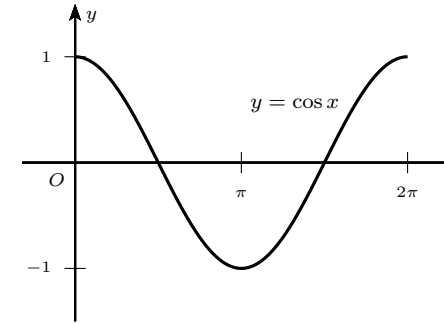
4 Trigonometric Graphs

Sine graph



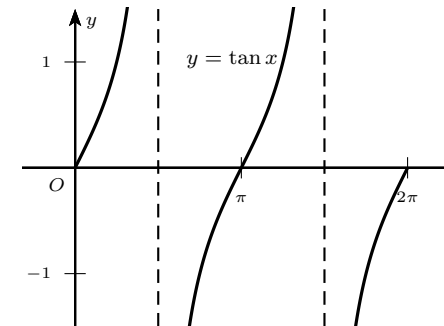
1. amplitude = 1
2. period = 2π

Cosine graph



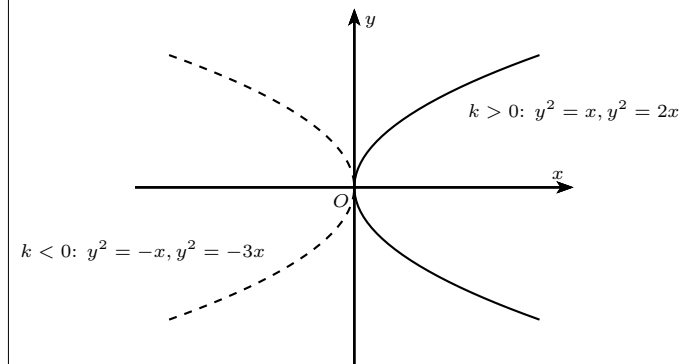
1. amplitude = 1
2. period = 2π

Tangent graph



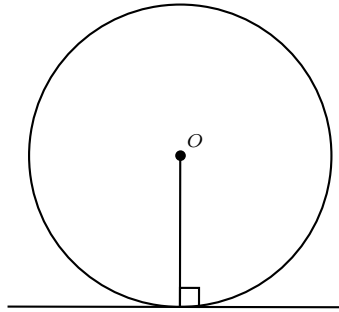
period = π

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

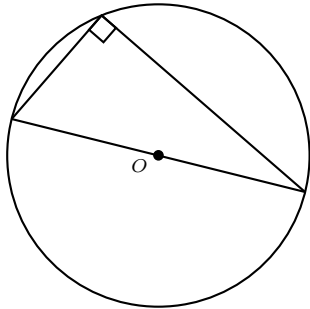


6 Proofs In Plane Geometry

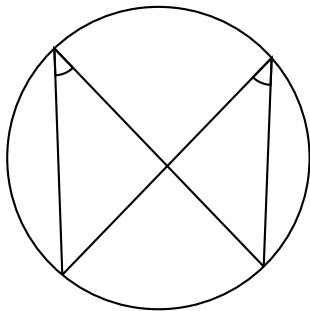
Properties Of Circles



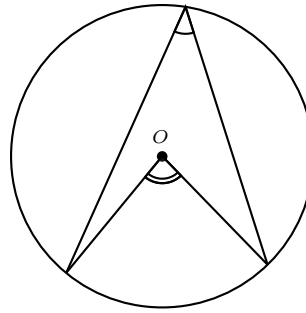
tan. \perp rad.



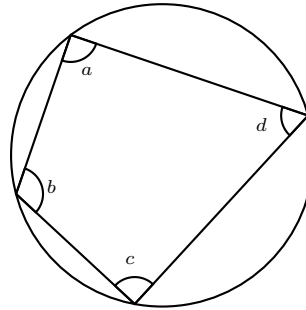
rt. \angle in semicircle



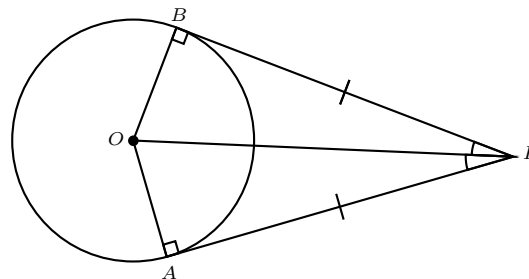
\angle s in same seg.



\angle at centre = 2 \angle at circ.



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

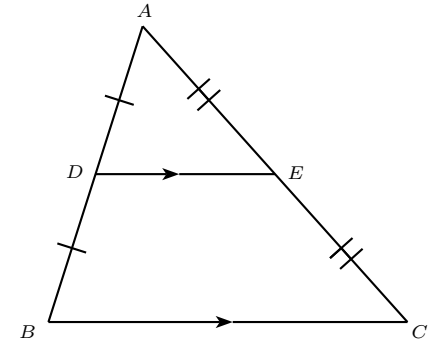


tan. from ext. pt.

Congruent & Similar Triangles

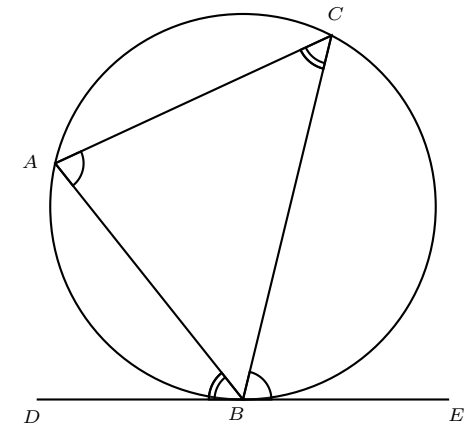
Congruent triangles	Similar triangles
SSS, SAS, AAS, RHS	SSS, SAS, AAA

Midpoint Theorem



If D and E are the midpoints of AB and AC respectively, then $DE \parallel BC$ 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 $\angle ACB = \angle ABD$.