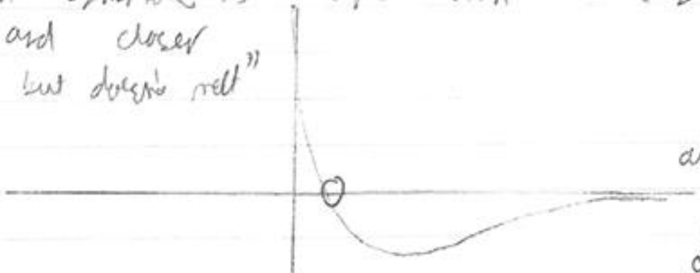
Henry F:

(1) "An asymptote is a line which a curve gets closer and closer to but doesn't reach"

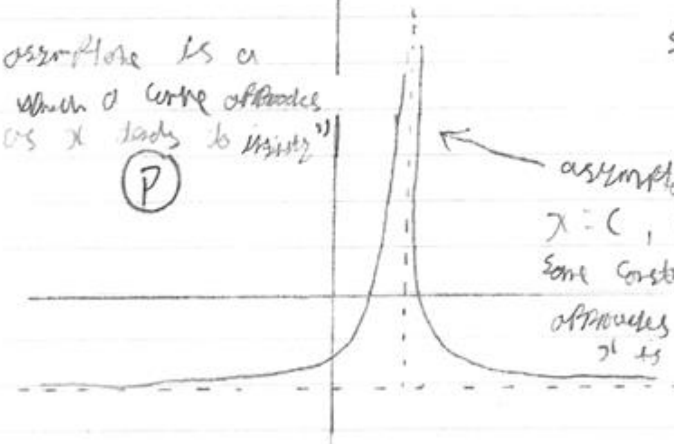
(C)



asymptote at x axis but curve crosses the x-axis, so (1) is incorrect.

(2) "An asymptote is a line which a curve approaches as x tends to infinity"

(P)

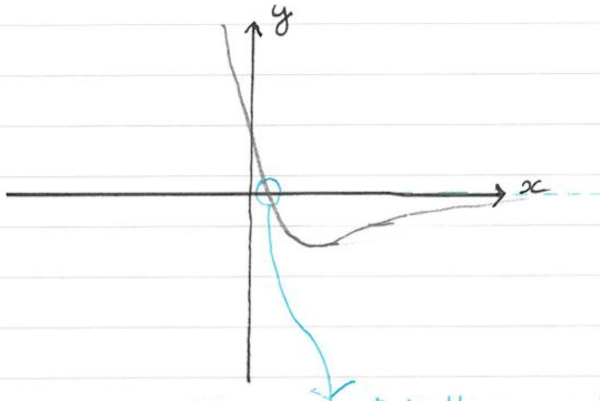


asymptote at $x = c$, where c is some constant. The curve approaches this line when x is not tending to infinity, so (2) is wrong

Misha

(3) "A curve can't cross an assymptote"

(C)



We can see that the curve does cross the x axis assymptote at this value despite it tending to the x axis as x becomes large

DISPROVING FALSE STATEMENTS ABOUT ASYMPTOTES

by Alex & Sayan

(3) "A curve can't cross an asymptote."

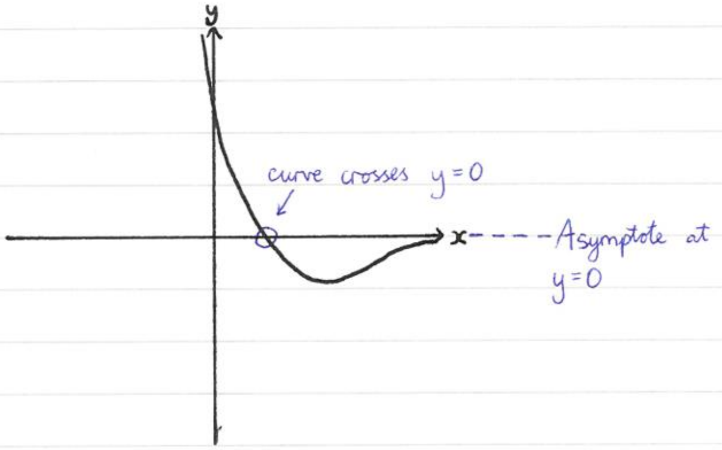


Fig. 1 $f(x)$

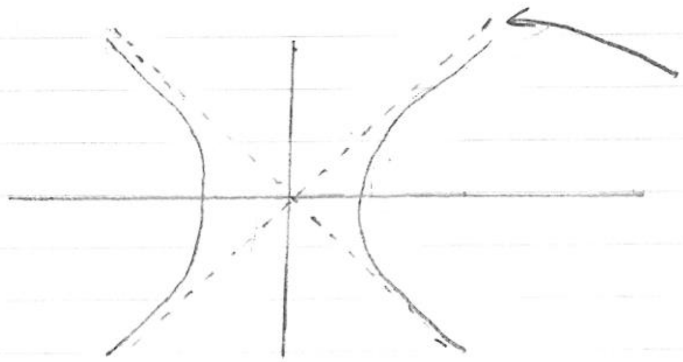
Asymptote $y=0$ arises from long-run behaviour of the above ~~curves~~ curve for $\lim_{x \to \infty} f(x)$

However, as shown above, $f(x)$ crosses $y=0$, thus (3) is false.

Henry F:

(4) "Asymptotes are parallel to the coordinate axes"

1



oblique asymptotes exist, so (4) is wrong

Alex C and Sayan S:

(5) "A graph can only have one asymptote parallel to each axis."

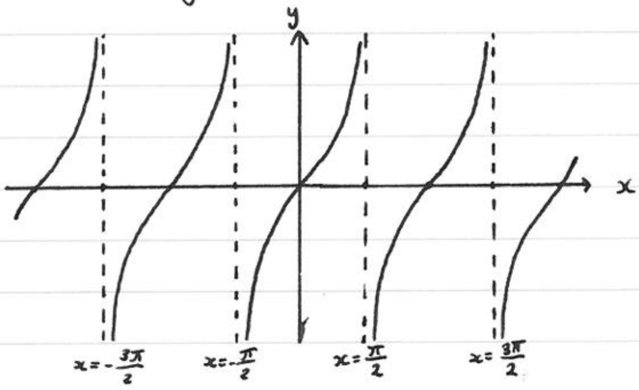
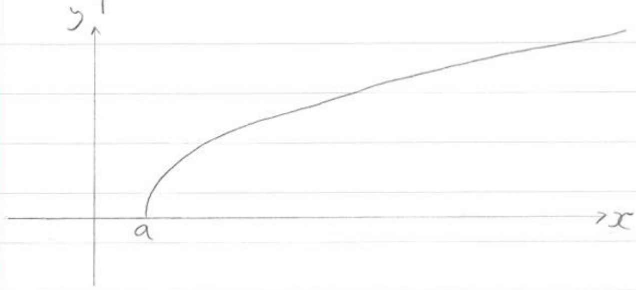


Fig. 2 $\tan(x)$

Multiple asymptotes parallel to the y axis at $x = \pi\left(k + \frac{1}{2}\right)$ $\forall k$ where $k \in \mathbb{Z}$
$\therefore$ (5) is false.

Travis Choy 17-6-26

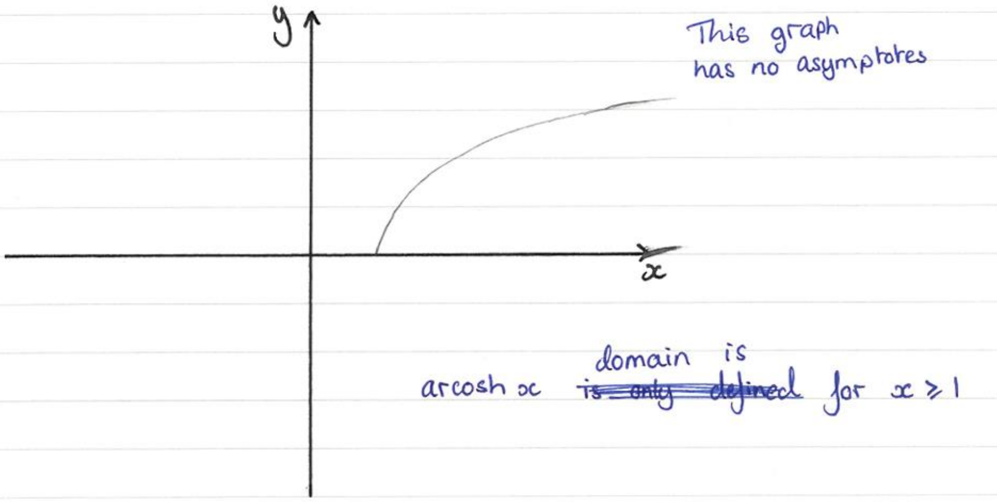
(6) "Asymptotes occur when a function isn't defined for certain input values"



- The graph is undefined for all $x < a$.
- The graph could be seen as a square root graph, ie. $k\sqrt{x-a}$, hence it ~~does~~ does not have an asymptote.
- Hence, asymptotes do not occur even though the function isn't defined for certain input values, therefore statement 6 is disproven by counter example.

Alex M

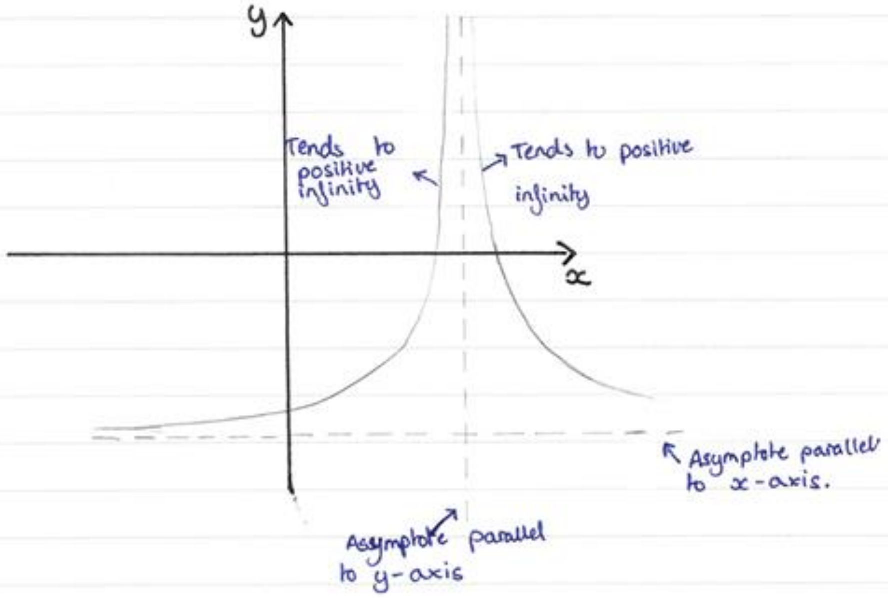
⑥ Asymptotes occur when a function isn't defined for certain input values



There is no asymptotes but the function is undefined for $x < 1$ so the statement is wrong

A function ~~which~~ tends to positive infinity on one side of an asymptote and tends to negative infinity on the other side.

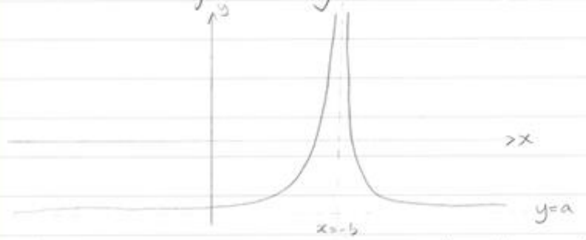
⑦



Both sides of the asymptote tend to positive infinity so the statement is false.

Travis C:

(7) "A function tends to positive infinity on one side of an asymptote and tends to negative infinity on the other side."



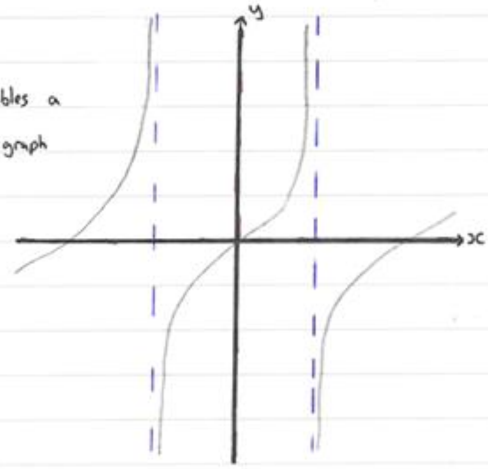
- The function may be the graph $y=\frac{1}{x^2}$ with some transformations applied to it, ie $y=a+\frac{k}{(x+b)^2}$
- ~~The~~ Taking a closer look at the asymptote $x=-b$, the graph tends to positive infinity on both sides of the asymptote, hence statement 7 is disproven by counter example.

Misab & Misha

(7) "A function tends to positive infinity on one side of an asymptote and tends to negative infinity on the other side"

Ⓜ

M resembles a $\tan(x)$ graph

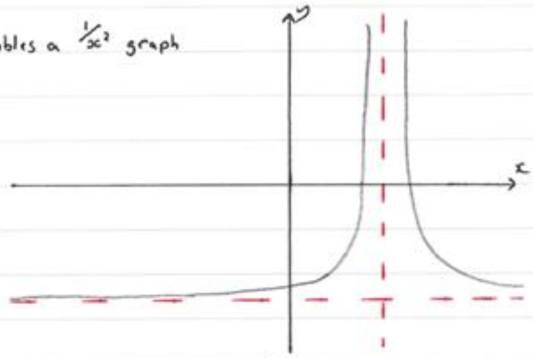


This graph has multiple verticle asymptotes, and each side of ~~the~~ it, the graph clearly tends to positive infinity and negative infinity.

This agrees with the above statement

Ⓟ

P resembles a $1/x^2$ graph

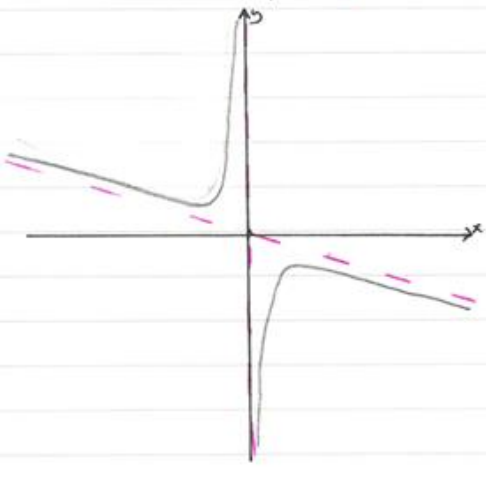


Either side of the vertical asymptote, the graph tends to positive infinity.

~~(This is because negative values share the~~

This disagrees with the above statement

Ⓛ



Asymptotes at y axis and $y = kx$.