

ASSIGNMENT 40

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1. (A) NONE!

to prove that $\sqrt{x+y} = \sqrt{x} + \sqrt{y}$ is incorrect, pick values: say, $x=4, y=9$ then

$$\sqrt{x+y} = \sqrt{13} \quad \leftarrow \text{not equal!}$$

$$\sqrt{x} + \sqrt{y} = \sqrt{4} + \sqrt{9} = 5 \quad \leftarrow$$

in the same way we show that the remaining two formulas are wrong.

2. $x-1 > 0$ and $x+1 > 0$

so $x > 1$ and $x > -1$... thus $x > 1$ (G)

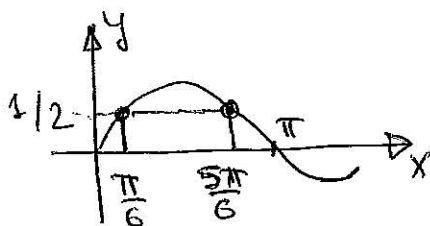
3. (I) = $\frac{1}{x^4-1}$ not defined for $x = \pm 1$

(III) = $\sqrt{x^4-1}$ not def'd when $x^4-1 < 0$, i.e. $x^4 < 1$
($-1 < x < 1$)

(II) = def'd for all x

answer = (C)

4. $\csc x = 2 \rightarrow \sin x = \frac{1}{2}$, so $x = \frac{\pi}{6}$ and $x = \pi - \frac{\pi}{6} = \frac{5\pi}{6}$



(E)

5. (F) ... W is an increasing function -- (I)

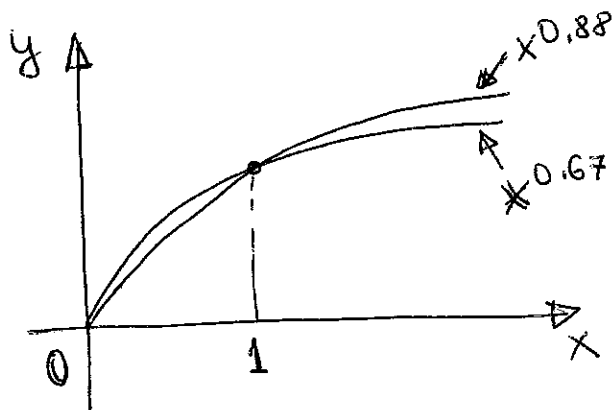
$W = \text{constant} \cdot M^{2/3}$... (III)

6. TRUE ; period of $\cos(ax)$ is $2\pi/a$

7. TRUE ; T is inv. prop. to S $\rightarrow T = c \cdot \frac{1}{S}$

then $S = c \cdot \frac{1}{T}$ so S is inv. prop. to T

8. FALSE ; look at graphs (so not true when $0 < x < 1$)



9. TRUE by def. of inverse function

10. FALSE ; it's enough to find one x for which $e^{2x} = 2e^x$ does not work.

$$\text{take } x=0 \dots e^{2x} = e^0 = 1$$

$$2e^x = 2e^0 = 2$$

11. TRUE ; solve $e^{2x} = 2e^x \quad | \div e^x$
 $e^x = 2 \rightarrow x = \ln 2$

12. FALSE ; arctan x is defined for all real numbers x

13. FALSE ; arcsin π is not defined since the domain of arcsin is $[-1, 1]$;
 as well, arcsin is the inverse of sin and not its reciprocal