Q1) True or false :

1) The domain of function $f(x)=\frac{x+3}{x-3}$ is $(-\infty,-3)\cup(-3,+\infty)$ ( F )

Domain: $x-3\neq 0 \Rightarrow x\neq 3 \Rightarrow (-\infty,3)\cup(3,+\infty)$

2) let $f(x)=2x-1$ and $g(x)=x^2$ then

$(f+g)(-1)=-2$ ( T )

$(f+g)=(2x-1)+(x^2)=x^2+2x-1$

$(f+g)(-1)=(-1)^2+2(-1)-1=1-2-1=-2$

3) The function $f(x)=-2x^7$ is odd function ( ✓ )

$f(-x)=-2(-x^7)=2x^7$

4) The domain of function $f(x)=\frac{4x}{\sqrt{x+3}}$ is $[-3,+\infty)$ ( X )

Domain $= x+3>0 \Rightarrow x>-3 = (-3,+\infty)$

5) The dependent variable for $z=\theta^3-6\theta+11$ is $z$ ( ✓ )

6) The function is symmetric about y-axis then its not have inverse ( ✓ )

7) $f(x)=\begin{cases}\sqrt{x} & x\geq 0\\ \frac{1}{x} & x<0\end{cases}$ then $f(-\sqrt{3})=\frac{1}{\sqrt{3}}$ ( X )

$f(-\sqrt{3})=-\frac{1}{\sqrt{3}}$

8) The function $f(x)=\cos x$ is odd function ( $\times$ )

$f(-x)=\cos(-x)=\cos x=f(x)$

$f(-x)=f(x) \Rightarrow$ even function

9) if $f(x)=\sqrt{x-1}$ then the domain of the inverse function $f^{-1}(x)$ is $[1,\infty)$ (   )

$y=\sqrt{x-1} \Rightarrow y^2=x-1 \Rightarrow x=y^2+1 \Rightarrow f^{-1}(x)=x^2+1$

$D_f=x\geq 1=[1,+\infty)$, $R_f=[0,+\infty)$

10) The domain of function $f+g$ is the intersection of the domain of $f$ and $g$ ( $\checkmark$ )

11) if $a$ and $b$ are real numbers then $|a+b|\geq|a|+|b|$ ( $\times$ )

$|a+b|\leq|a|+|b|$

12) The function $f(x)=-x^3$ is an even function ( $\times$ )

13) The range of function $f(x)=\sqrt{2-x}$ is $(-\infty,2]$ ( $\times$ )

$R=[0,+\infty)$

14) The domain of $f/g$ is the intersection of the the domain of $f$ and $g$ ( $\times$ )

15) if $a$ is a real number then $|a| = -|a|$ ( ✗ )

16) The function $f(x) = \sin x$ is odd function ( ✓ )

17) if $f(x) = \sqrt{x-1}$ then the domain of the inverse function $f^{-1}(x)$ is $[1, \infty)$ ( ✗ )

$y = \sqrt{x-1} \Rightarrow y^2 = x - 1 \Rightarrow x = y^2 + 1 \Rightarrow f^{-1}(x) = x^2 + 1$

$D_{f^{-1}(x)} = (-\infty, +\infty)$

18) The domain of the function $f - g$ is the intersection of domain of $f$ and $g$ ( ✓ )

20) The range of function $f(x) = \frac{1}{x-1}$ is $(1, \infty)$ ( ✗ )

$y = \frac{1}{x-1} \Rightarrow yx - y = 1 \Rightarrow yx = 1 + y \Rightarrow x = \frac{1+y}{y}$

$f^{-1}(x) = \frac{1+x}{x}$, $D_{f^{-1}} = (-\infty, 0) \cup (0, \infty) = R_f$

21) The graph of an even function is symmetric about the $y$-axis ( ✓ )

22) The graph of $y = (x+3)^2 - 4$ is obtained by translating the graph $y = x^2$ right 3 unit and down 4 unit ( ✗ )

left

Q2) Choose the correct answer :

1) if $f(x)=9+\sqrt{x}$ then the inverse formula $f^{-1}(x)$

a) $x^2-9$ b) $(x-9)^2$ c) $(x+9)^2$ d) $x^2+9$

$y=9+\sqrt{x}$

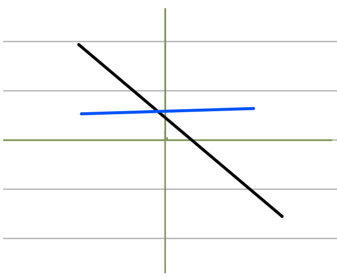
$y-9=\sqrt{x}$

$(y-9)^2=x$

$f^{-1}(x)=(x-9)^2$

2) The graph of function does not have inverse is

a)



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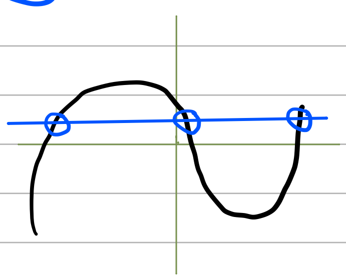

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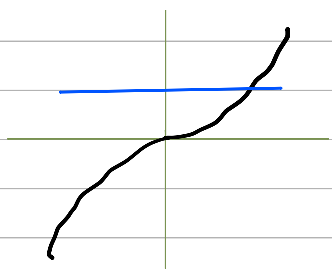
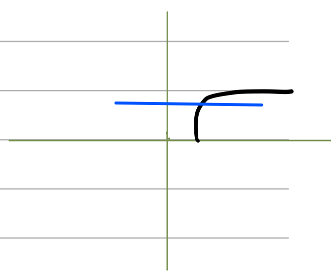


d)



3) The range of function $f(x)=5-\sqrt{x-5}$ is

a) $(-\infty,5)$ b) $(5,\infty)$ c) $(-\infty,5]$ d) $[5,\infty)$

$D_f = x-5 \geq 0 \Rightarrow x \geq 5 = [5,+\infty)$

$f(5)=5-\sqrt{5-5}=5$

$f(6)=5-\sqrt{6-5}=5-1=4$

$R_f=(-\infty,5]$

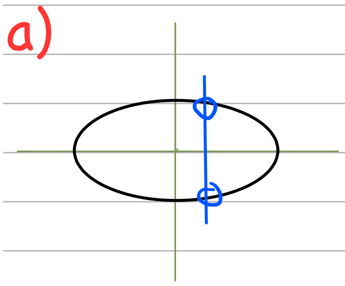
4) if $f(x)=\sqrt{x+1}$ and $g(x)=\sqrt{x+1}$ then the domain of function $f/g$

a) $\mathbb{R}$ b) $(-\infty,-1)$ c) $[-1,\infty)$ d) $(-1,\infty)$

$\frac{f}{g}=\frac{\sqrt{x+1}}{\sqrt{x+1}}=1$ , $D_{f/g}=(-1,\infty)$

5) The graph that represents a function

a)



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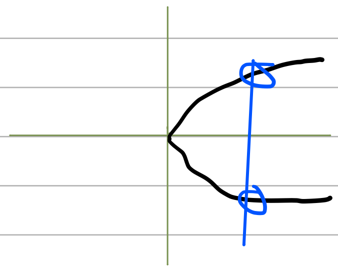
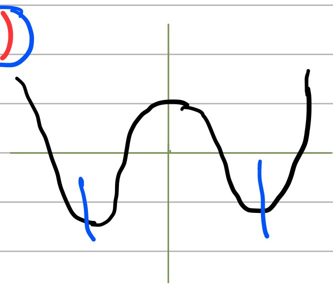


c)



d) none

6) The range of $f(x)=6-(x-6)^2$ is

a) $\mathbb{R}$ b) $(-\infty,6]$ c) $(6,\infty)$ d) $[6,\infty)$

$f(x)=6-(x^2-12x+36)=-x^2+12x-30$

$f(-\frac{b}{2a})=(-\frac{12}{2(-1)})=f(6)=-6^2+12(6)-3=6$

7) The domain of the function $f(x)=3+\sqrt{4-x^2}$ is

a) $(-\infty,-2]\cup[2,\infty)$ b) $[-2,2]$ c) $[0,\infty)$ d) $[3,\infty)$

$4-x^2\geq 0 \Rightarrow 4\geq x^2$

$|x|\leq 2$

$-2\leq x\leq 2$

8) if the function $f(x) = \sqrt{x-2}$ and $g(x) = x^2+3$ then the domain of function $f/g$ is

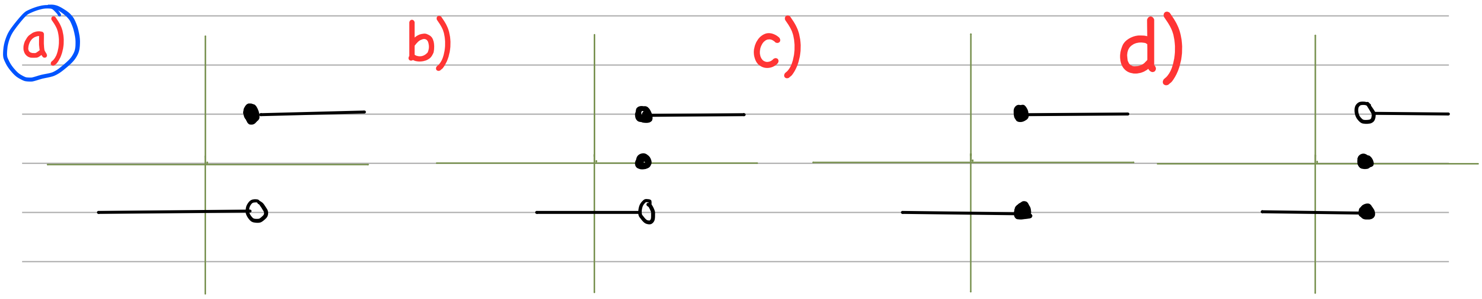
a) $[-2, \infty)$ b) $(-2, \infty)$ c) $[2, \infty)$ d) $(2, \infty)$

$D_f = x-2 \geq 0 = x \geq 2 = [2, \infty)$

$D_g = \mathbb{R} = (-\infty, +\infty)$

$D_{f/g} = [2, \infty) \cap (-\infty, +\infty) = [2, \infty)$

9) The graph that represent function is




10) if $f(x) = x^2$ and $g(x) = \sqrt{1-x}$ then the domain of $f \circ g$ is

a) $(-\infty, \infty)$ b) $[1, \infty)$ c) $(-\infty, 1]$ d) $(-\infty, 1) \cup (1, \infty)$

$D_{f \circ g} = D_g \cap D_R$

$(f \circ g)(x) = f(g(x)) = f(\sqrt{1-x}) = (\sqrt{1-x})^2 = 1-x$

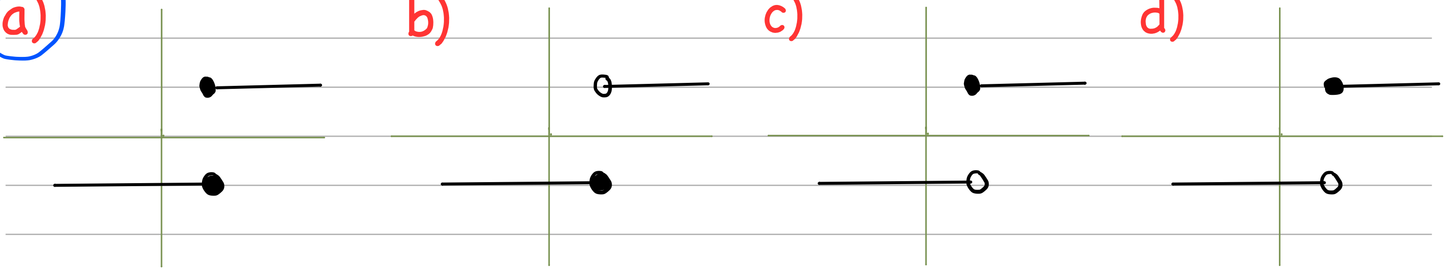
$D_R = (-\infty, +\infty)$

$D_g = 1-x \geq 0 \Rightarrow 1 \geq x \Rightarrow x \leq 1 = (-\infty, 1]$

$D_{f \circ g} = (-\infty, 1] \cap (-\infty, \infty) = (-\infty, 1]$

11) The graph does not represent a function is

a) b) c) d)



12) The range of $f(x) = -5 + \sqrt{x-3}$ is

a) $[-5, \infty)$ b) $[0, \infty)$ c) $[3, \infty)$ d) $(-\infty, \infty)$

$D = x-3 \geq 0 = x \geq 3 = [3, +\infty)$

Range:

$f(3) = -5 + \sqrt{3-3} = -5$

$f(4) = -5 + \sqrt{4-3} = -5 + \sqrt{1} = -5 + 1 = -4$

$R = [-5, +\infty)$

13) The range of $f(x) = 2 - \sqrt{x-1}$ is

a) $(-\infty, 2]$ b) $[2, \infty)$ c) $[1, \infty)$ d) $(-\infty, 1]$

$D = x-1 \geq 0 = x \geq 1 = [1, +\infty)$

Range:

$f(1) = 2 - \sqrt{1-1} = 2$

$f(2) = 2 - \sqrt{2-1} = 2 - \sqrt{1} = 2 - 1 = 1$

$f(3) = 2 - \sqrt{3-1} = 2 - \sqrt{2} = 0.6$

$R = (-\infty, 2]$

14) The range of function $f(x) = 3 - (x+5)^2$ is

a) $[-3, +\infty)$ b) $(-\infty, 3]$ c) $(-3, +\infty)$ d) $(-\infty, 3)$

$f(x) = 3 - (x^2 + 10x + 25) = -x^2 - 10x - 22$

$f(-\frac{b}{2a}) = f(-\frac{-10}{2(-1)}) = f(-5) = -(-5)^2 - 10(-5) - 22$

$= -25 + 50 - 22 = 3$

$R = (-\infty, 3]$

15) The range of function $f(x) = 3 - (x+1)^4$ is

a) $[-3, +\infty)$ b) $(-\infty, 3]$ c) $(-3, +\infty)$ d) $(-\infty, 3)$

$D = (-\infty, +\infty)$

$f(0) = 3 - (0+1)^4 = 2$

$f(-1) = 3 - (-1+1)^4 = 3$

$f(-2) = 3 - (-2+1)^4 = 2$

$f(-3) = 3 - (-3+1)^4 = 3 - (-2)^4 = 3 - 16 = -13$

$f(-4) = 3 - (-4+1) = 3 - (-3)^4 = 3 - 81$

$f(1) = 3 - (1+1)^4 = 3 - 16 = -13$

16) if $f(x) = 3 + \sqrt{x+1}$ then $f^{-1}(x) =$

a) $(x-3)^2 - 1$ b) $(x+3)^2 - 1$ c) $(x-1)^2 - 3$ d) $(x-1)^2 + 3$

$y = 3 + \sqrt{x+1}$

$y - 3 = \sqrt{x+1}$

$(y-3)^2 = x + 1$

$x = (y-3)^2 - 1$

$f^{-1}(x) = (x-3)^2 - 1$

17) The domain of the function $f(x)=\frac{x\sqrt{x}-\sqrt{x}}{x-1}$ is

a) $\mathbb{R}$ b) $[0,+\infty)$ c) $[0,1)\cup(1,+\infty)$ d) $(-\infty,1)\cup(1,+\infty)$

$x \geq 0$ , $x-1 \neq 0 \Rightarrow x = 1$

$D = [0,1)\cup(1,+\infty)$

18) The range of the function $f(x)=3-\sqrt{x+3}$ is

a) $[-3,+\infty)$ b) $(-\infty,3]$ c) $(-3,+\infty)$ d) $(-\infty,3)$

$D = x+3 \geq 0 \Rightarrow x \geq -3 \Rightarrow [-3,+\infty)$

Range:

$f(-3) = 3 - \sqrt{-3+3} = 3$

$f(-2) = 3 - \sqrt{-2+3} = 3 - \sqrt{1} = 2$

$R = (-\infty, 3]$

19) if $f(x)=\sqrt[3]{5x}$ then $f^{-1}(x)=$

a) $\frac{x^3}{5}$ b) $\frac{x^{1/3}}{5}$ c) $\frac{x^5}{3}$ d) $\frac{x^{1/3}}{3}$

$y = \sqrt[3]{5x} \Rightarrow y^3 = 5x$ , $x = \frac{y^3}{5}$

$f^{-1}(x) = \frac{x^3}{5}$

20) if the function $f(x)=\sqrt{x}$ and $g(x)=x^3+1$ then $f(g(2))=$

a) $2\sqrt{2}+1$ b) $3\sqrt{2}+1$ c) $3$ d) $9$

$f(g(x))=f(x^3+1)=\sqrt{x^3+1}$

$f(g(2))=\sqrt{2^3+1}=\sqrt{2^2\cdot 2}+1=2\sqrt{2}+1$

21) if $f(x)=x^2-3$ and $g(x)=\sqrt{x+1}$ then $(f\circ g)(x)=$

a) $x-2$ b) $\sqrt{x^2-2}$ c) $\sqrt{x-2}$ d) $x-3$

$(f\circ g)(x)=f(g(x))=f(\sqrt{x+1})=(\sqrt{x+1})^2-3=x+1-3=x-2$

22) if $f(x)=x^2-3$ and $g(x)=|x+1|$ then $(f\circ g)(x)=$

a) $(x+1)^2-3$ b) $|x^2-2|$ c) $|x-2|$ d) $(x-3)^2+1$

$(f\circ g)(x)=f(g(x))=f(|x+1|)=|x+1|^2-3$

$=(x+1)^2-3$