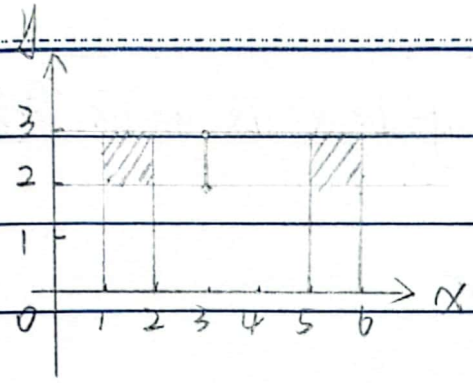
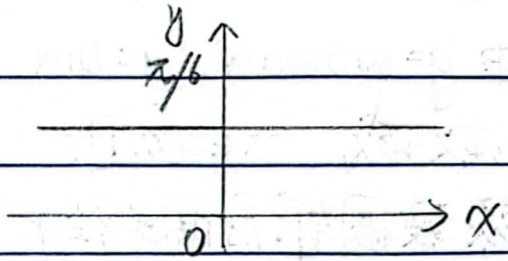
4. (1)



(2)



5. 下无界：$\forall x \in A$，在A中总$\exists s < x$

上无界：$\forall x \in A$，在A中总$\exists s > x$

无界：$\forall x \in A$，不$\exists M$，使$|x| \le M$.

8. (1) $\sup A = 1$　$\sup B = \sqrt{5}$

$\inf A = \frac{1}{2}$　$\inf B = -1$

(2) $x_n$min $= \frac{1}{2}$　x_n无最大值

$x_{max} = \sqrt{5}$　x无最小值

(3) 若集合存在最大(小)值，则该值为它的上(下)确界

若且集合的上(下)确界存在，最值不一定存在

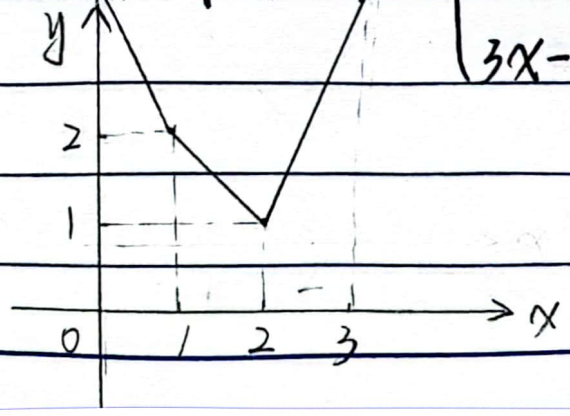
12. (3) $f(x) = \sqrt{1-\cos^2 x} = |\sin x|$　$g(x) = \sin x$

对应关系不同　不是相等函数

(5) $f(x) = 2^x + x + 1$　$g(t) = 2^t + t + 1$　是相等函数

15.

$$f(x) = \frac{5}{2}|x-2| + |x-1| = \begin{cases} -3x+5, & x \le 1 \\ -x+3, & 1 < x < 2 \\ 3x-5, & x \ge 2 \end{cases}$$



16. (4) 由 $y=\arcsin x$, $y=\ln x$ $y=x^2$ $y=1+x$ 及 $y=\sqrt{x}$ 复合

定义域 $x\in(0,1]$.

20. 由题设圆锥底面半径 r $\theta R=2\pi r$

$$V=\frac{1}{3}\cdot\pi\cdot r^2\cdot\sqrt{R^2-r^2}$$

$$=\frac{1}{3}\cdot\pi\frac{\theta^2R^2}{4\pi^2}\cdot\sqrt{R^2-\frac{\theta^2R^2}{4\pi^2}}$$

$$=\frac{\theta^2R^3}{24\pi^2}\sqrt{4\pi^2-\theta^2}\qquad\theta\in(0,2\pi).$$

B. 4. (1) $f:x\mapsto\sqrt{x^2-1}$ $D(x)=(-\infty,-1]\cup[1,+\infty)$ $R(x)=[0,+\infty)$

$g:x\mapsto\sqrt{1-x^2}$ $D(x)=[-1,1]$ $R(x)=[0,1]$

∴复合运算, $(fog)(x)=0\ (x=0)$ $(gof)(x)=\sqrt{-x^2+2}\ (1\le[x]\le\sqrt{2}$

(2) $f(x)=\begin{cases}2x, & x\in[-1,1]\\ x^2, & x\in(1,3)\end{cases}$ $D(x)=[-1,3)$ $R(x)=[-2,9)$.

$g(x)=\frac{1}{2}\arcsin(\frac{x}{2}-1)$ $D(x)=[0,4]$ $R(x)=[-\frac{\pi}{4},\frac{\pi}{4}]$

$(fog)(x)=\arcsin(\frac{x}{2}-1)$ $x\in[0,4]$

$$(gof)(x)=\begin{cases}\frac{1}{2}\arcsin(x-1) & x\in[-1,1]\\ \frac{1}{2}\arcsin(\frac{x^2}{2}-1) & x\in(1,2]\end{cases}$$

5. $$f'(x)=\begin{cases}y=\sqrt{x+1} & x\in(-1,0]\\ y=\sqrt{x-1} & x\in[1,2]\end{cases}$$