1.
$$P\{-1 \leqslant X \leqslant \frac{1}{2}\} = F(\frac{1}{2}) - F(-1) = \frac{1}{4} - 0 = \frac{1}{4}$$

2. $\mu = 2, \sigma = 2$
$$\frac{X-2}{2}$$

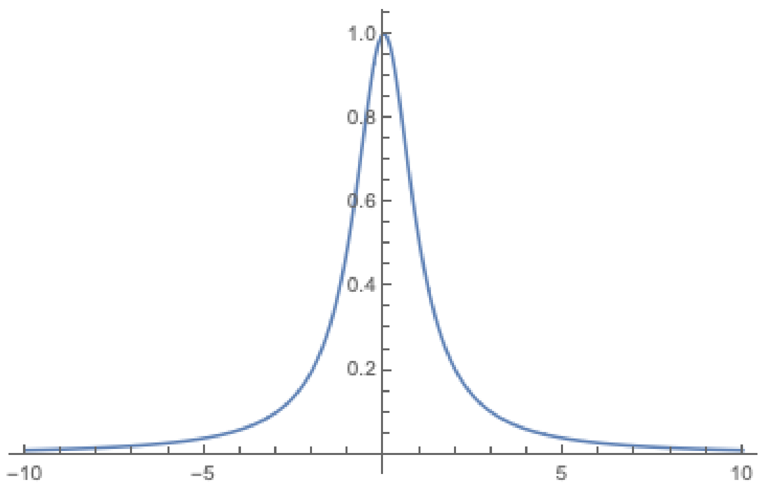
3. A. 不满足右连续.$-2 < x < 0 \Rightarrow -2 \leqslant x < 0$

   B. 不满足非减

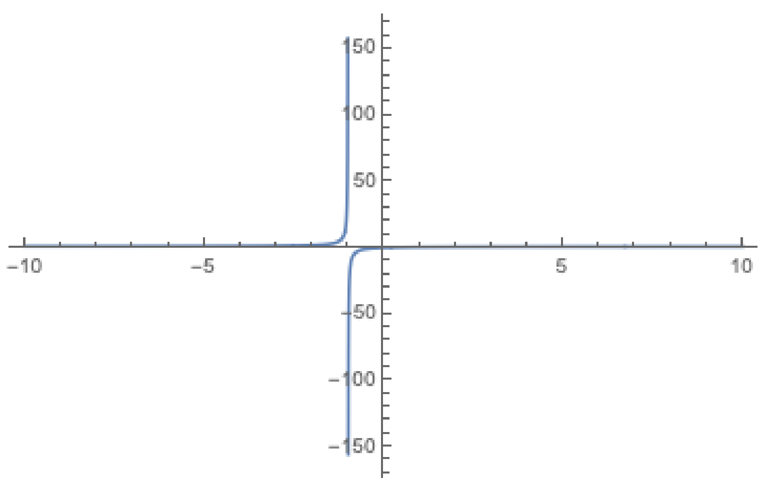
   C. 对

   D. $x > \frac{1}{4} \Rightarrow F(x) > 1$ 不满足CDF的性质.

4. A. 不满足非减, $F(+\infty) \neq 1, F(+\infty) = 0$



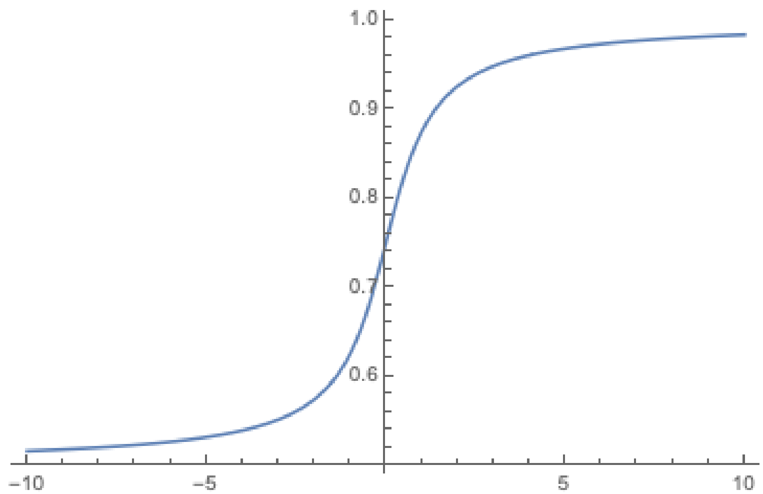
   B. 在-1这个地方不满足非减, 以及不满足$F(+\infty) = 1$

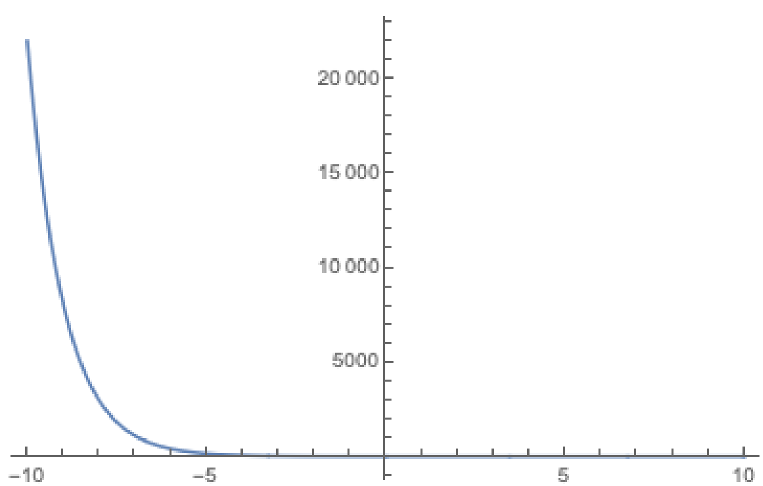


   C. 对

   D. 不满足非减, 也不满足$F(+\infty) = 1$

5.
$$P\{-a \leqslant X \leqslant a\} = \Phi(a) - \Phi(-a) = \Phi(a) - (1 - \Phi(a)) = 2\Phi(a) - 1$$


1.0
0.9
0.8
0.7
0.6
−10
−5
5
10


20 000
15 000
10 000
5000
−10
−5
5
10

6.
$$C_{14}^{3}0.2^{3}0.8^{11}$$

7. A, 注意$Y = sin(X)$在区间$0 < x < \pi$上并不是单调函数. 所以不能够用定理.这时候必须要要用最原始的方法.

$$\begin{aligned}
P\{(Y \leqslant y\} &= P\{sin(X) < y\} \\
&= P\{X < arcsin(y)\} + PX > \pi - arcsin(y) \\
&= F_Y[arcsin(y)] + 1 - F_Y[\pi - arcsin(Y)]
\end{aligned}$$

对此求导

$$\begin{aligned}
F_Y^{'}[arcsin(y)] - F_Y^{'}[\pi - arcsin(y)] &= f_X[arcsin(y)]arcsin^{'}(y) - f_X[\pi - arcsin(y)](\pi - arcsin(y))^{'} \\
&= \frac{2}{\pi^2}arcsin(y)\frac{1}{\sqrt{1-y^2}} - \frac{2}{\pi^2}(\pi - arcsin(y))(-\frac{1}{\sqrt{1-y^2}}) \\
&= \frac{2}{\pi\sqrt{1-y^2}}
\end{aligned}$$