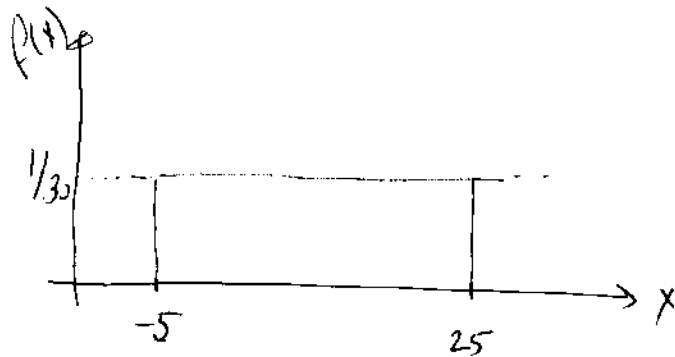


# STAT 3600 H4 SOLUTION.

Σ 15 pts

6 pts

1)  $A = -5$      $B = 25$      $f(x) = \frac{1}{B-A} = \frac{1}{30}$



1 pt  
a)  $P(X < 0) = \int_{-5}^0 \frac{1}{30} dx = \frac{1}{6} = 0.1667$

1 pt  
b)  $P(-2.5 < X < 15) = \int_{-2.5}^{15} \frac{1}{30} dx = \frac{17.5}{30} = .58\bar{3}$

1 pt

c)  $P(X > 26) = 0$

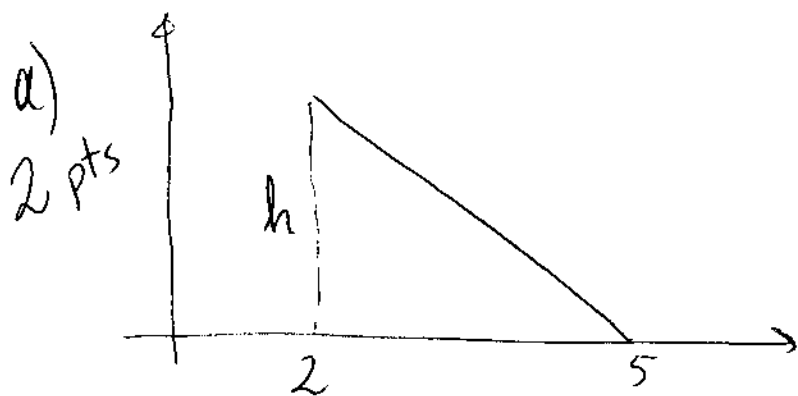
3 pts  
d)  $E(X) = \int_{-5}^{25} x \frac{1}{30} dx = \frac{1}{30} \int_{-5}^{25} x dx = \frac{1}{30} \left( \frac{x^2}{2} \right)_{-5}^{25} = \underline{\underline{10}}$

$$V(X) = E(X^2) - (E(X))^2$$

$$E(X^2) = \int_{-5}^{25} x^2 \frac{1}{30} dx = \frac{1}{30} \int_{-5}^{25} x^2 dx = \frac{1}{30} \left( \frac{x^3}{3} \right)_{-5}^{25} = 175$$

$$V(X) = 175 - (10)^2 = \underline{\underline{75}}$$

2)  $f(x) = ax + b \quad 2 \leq x \leq 5 \quad f(5) = 0$



$$\frac{3h}{2} = 1 \quad h = 2/3$$

$$f(2) = h \Rightarrow 2a + b = 2/3$$

$$f(5) = 0 \Rightarrow \del{5a + b = 0}$$

$$5a + b = 0$$

1 pt

b)  $P(X > 3)$

$$3a = -2/3 \quad \boxed{a = -2/9}$$

$$\boxed{b = 10/9}$$

$$= \int_3^5 \left( \frac{-2}{9}x + \frac{10}{9} \right) dx = \left( \frac{-2}{18}x^2 + \frac{10}{9}x \right) \Big|_3^5 = \underline{0.444}$$

2 pts

c)  $F(x) = ?$

$$F(x) = \int_2^x \left( \frac{-2}{9}y + \frac{10}{9} \right) dy = \left( \frac{-2}{18}y^2 + \frac{10}{9}y \right) \Big|_2^x$$

$$= \left( \frac{-2}{18}x^2 + \frac{10}{9}x \right) - \left( \frac{-8}{18} + \frac{20}{9} \right)$$

$$\boxed{F(x) = \frac{-x^2}{9} + \frac{10x}{9} - \frac{3216}{189} = \frac{1}{9}(-x^2 + 10x - 16)}$$

pts  
3)

$$a) P(Z > 2.50) = 1 - 0.9938 = 0.0062$$

$$b) P(Z \geq 2.50) = 1 - 0.9938 = 0.0062$$

$$\begin{aligned} c) P(-1.20 \leq Z \leq 1.20) &= P(Z \leq 1.20) - P(Z \leq -1.20) \\ &= \Phi(1.20) - \Phi(-1.20) \\ &= 0.8849 - 0.1151 \\ &= 0.7698 \end{aligned}$$

$$d) P(Z \leq -2.20) = 0.0139$$