Page 1.

$X \sim N(0,1)$

$P(-0.2 < X < 1.4) = P(X < 1.4) - P(X < -0.2)$

$= 0.4985$

Page 2

$$f(x) = \begin{cases} C\sqrt{64-x^2} & -8 < x < 8 \\ 0 & \text{otherwise} \end{cases}$$

we can have: $\int_{-8}^{8} C\sqrt{64-x^2}\,dx = 1$

$\Rightarrow C = \frac{1}{32\pi}$

the probability that $X = 0.587778$ is zero.
this is because it is a continuous distribution and probability for a single point is 0.

Page 3

$P(A) = \frac{1}{6}$ $\quad B = \{(1,2), (2,3), (3,4), (4,5), (5,6), (6,5), (2,1), (3,2), (4,3), (5,4)\}$.

$P(B) = \frac{10}{36} = \frac{5}{18}$

$P(B|A) = \frac{1}{6}$

$P(AB) = P(B|A) \cdot P(A) = \frac{1}{36} \neq P(A) \cdot P(B)$

So, these events are not independent and not mutually exclusive.

Page 4

$$z = \frac{x-\mu}{\sigma} = \frac{-552 - 1000}{800} = -1.94$$

Page 5

$$f(x) = \begin{cases} C(1-x^2) & -1 < x < 1 \\ 0 & \text{otherwise.} \end{cases}$$

$$C\int_{-1}^{1} 1 - x^2 dx = 1 \Rightarrow C \cdot \frac{4}{3} = 1 \Rightarrow C = \frac{3}{4}$$

$$F(x) = \frac{3}{4}\int_{-1}^{x} 1 - t^2 dt$$

$$= \frac{3}{4}(t - \frac{1}{3}t^3)\Big|_{-1}^{x} = \frac{3}{4}(x - \frac{1}{3}x^3 + \frac{2}{3})$$

$$= \frac{3}{4}x - \frac{1}{4}x^3 + \frac{1}{2}$$

$$F(x) = \frac{1}{2} \Rightarrow \frac{3}{4}x - \frac{1}{4}x^3 + \frac{1}{2} = \frac{1}{2}$$

$$\Rightarrow x_1 = 0, \underbrace{x_2 = -\sqrt{3}, \ x = \sqrt{3}.}_{\text{exclude.}}$$

The probability that $x = 0.025$ is zero.

The median is 0.