**Questions 6-9 (Two alternative solutions)**

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Let $X$ represent the value of the bill selected.

| X | P(X = x) |
|---|---|
| \$1 | 0.5 |
| \$2 | 0.25 |
| \$5 | 0.15 |
| \$10 | 0.05 |
| \$100 | 0.05 |

E($X$) = $\mu_X = \$7.25$

Since $\mu_X - \$20 = -\$12.75$, we expect to lose, on average, \$12.75. So the game is not fair.

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Let $X$ represent the total cost of playing the game. That is the value of the bill selected minus \$20.

| X | P(X = x) |
|---|---|
| –\$19 | 0.5 |
| –\$18 | 0.25 |
| –\$15 | 0.15 |
| –\$10 | 0.05 |
| \$80 | 0.05 |

E($X$) = $\mu_X = -\$12.75$

Since $\mu_X = -\$12.75$, we expect to lose, on average, \$12.75. So the game is not fair.

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**10.** Let $X$ represent the amount won when playing the game. So

| X | P(X = x) |
|---|---|
| \$0 | $\frac{5}{6}$ |
| \$5 | $\frac{1}{6}$ |

Thus $E(X) = \mu_X = 0\left(\frac{5}{6}\right) + \$5\left(\frac{1}{6}\right) = \$0.83$. For the game to be fair the person should pay \$0.83.

**11.** P(X = 5) = 0.1

**12.** P(X < 3) = 0.1 + 0.2 = 0.3

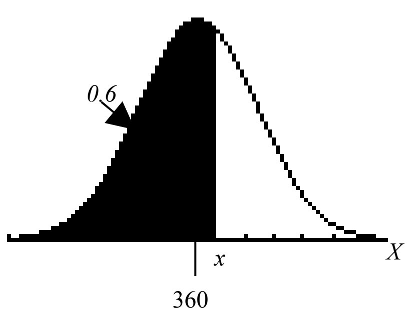
**13.** $\mu_X = 3.1$, **14.** $\sigma_X^2 = 1.29$, and **15.** $\sigma_X = 1.136$

**16.** $\mu_Y = 2$, $\mu_X = 6.2$, and **17.** $\sigma_Y = \sqrt{2\sigma_X^2} = 1.606$

**18.** $P(0 \le X \le 3) = 1$ **19.** $P(2 \le X \le 3) = 0.4$

**20.** $P(X = 2) = 0$ **21.** $P(X < 2) = 0.6$ **22.** $P(1 \le X \le 3) = 0.75$

**23.**




$x$ = invNorm(0.6, 360, 50) = 372.667

So the probability that the store will make less than \$372.67 is 0.6.