A restaurant offers two menus, one for weekdays and the other for weekends. Each menu offers four set prices, and the probability distributions for the amount someone pays is as follows:

Weekday:

x	**10**	**15**	**20**	**25**
P(X = x)	0.2	0.5	0.2	0.1

Weekend:

y	**15**	**20**	**25**	**30**
P(Y = y)	0.15	0.6	0.2	0.05

Who would you expect to pay the restaurant most: a group of 20 eating at the weekend, or a group of 25 eating on a weekday?

Let's start by finding the expectation of a weekday and a weekend. X represents someone paying on a weekday, and Y represents someone paying at the weekend.

$$E(X) = 10 \times 0.2 + 15 \times 0.5 + 20 \times 0.2 + 25 \times 0.1$$
$$= 2 + 7.5 + 4 + 2.5$$
$$= 16$$

$$E(Y) = 15 \times 0.15 + 20 \times 0.6 + 25 \times 0.2 + 30 \times 0.05$$
$$= 2.25 + 12 + 5 + 1.5$$
$$= 20.75$$

Each person eating at the restaurant is an independent observation, and to find the amount spent by each group, we multiply the expectation by the number in each group.

25 people eating on a weekday gives us $25 \times E(X) = 25 \times 16 = 400$

20 people eating at the weekend gives us $20 \times E(Y) = 20 \times 20.75 = 415$

This means we can expect 20 people eating at the weekend to pay more than 25 people eating on a weekday.