a)
Sam is running a game at the local fayre to raise money for charity. In the game, you roll two six-sided dice. You win if their sum is a 7.
The game costs 50p to play, and if you win you get a chocolate bar. The chocolate bars cost Sam £1 for a pack of 3.
180 people are expected to play the game.
How much money should Sam expect to raise for charity?

What is the probability that a player wins?	<table><tr><th></th><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>6</th></tr><tr><th>1</th><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>**7**</td></tr><tr><th>2</th><td>3</td><td>4</td><td>5</td><td>6</td><td>**7**</td><td>8</td></tr><tr><th>3</th><td>4</td><td>5</td><td>6</td><td>**7**</td><td>8</td><td>9</td></tr><tr><th>4</th><td>5</td><td>6</td><td>**7**</td><td>8</td><td>9</td><td>10</td></tr><tr><th>5</th><td>6</td><td>**7**</td><td>8</td><td>9</td><td>10</td><td>11</td></tr><tr><th>6</th><td>**7**</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td></tr></table> $P(\text{scoring } 7) = \frac{6}{36} = \frac{1}{6}$
How many players do we expect to win?	$\frac{1}{6}$ of $180 = 30$
How much will this cost Sam?	30 chocolate bars $30 \div 3 = 10$ 10 packs cost £10
How much will Sam get from players?	$180 \times £0.50 = £90$
How much will Sam raise for charity?	$£90 - £10 = £80$

b)
Robbie is running a game at the local fayre to raise money for charity. In the game, you flip three coins. You win if you flip three heads or three tails.
The game costs £1 to play, and if you win you get a big bag of sweets. The bags of sweets cost Robbie £1.50.
120 people are expected to play the game.
How much money should Robbie expect to raise for charity?

What is the probability that a player wins?	**HHH** TTH HHT THT HTH HTT THH **TTT** $P(\text{winning}) = \frac{2}{8} = \frac{1}{4}$
How many players do we expect to win?	$\frac{1}{4}$ of $120 = 30$
How much will this cost Robbie?	
How much will Robbie get from players?	
How much will Robbie raise for charity?	

c)
Charlie is running a game at the local fayre to raise money for charity. In the game, you flip a coin and roll a die. You win if you flip 'heads' and roll a factor of 6.
The game costs 20p to play, and if you win you get a lollipop. The lollipops cost Charlie £1 for a pack of 12.
180 people are expected to play the game.
How much should Charlie expect to raise for charity?