

SAMPLE SPACES - PRACTICE QUESTIONS

1.

Abdi has two fair six-sided dice.

He is going to roll them both and add the scores together to get a final score.

(a) Complete the sample space diagram below.

| + | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| 6 | 7 | 8 | 9 | 10 | 11 | 12 |

(b) What is the probability that Abdi scores a 7?

$$\frac{6}{36} = \frac{1}{6}$$

(c) What is the probability that Abdi scores less than 4?

$$\frac{3}{36} = \frac{1}{12}$$

(d) What is the probability that Abdi scores more than 9?

$$\frac{10}{36} = \frac{5}{18}$$

(e) What is the probability that Abdi scores more than 12?

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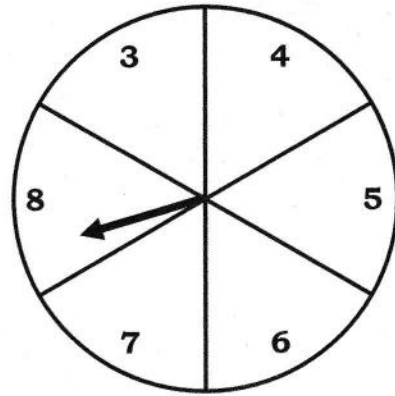
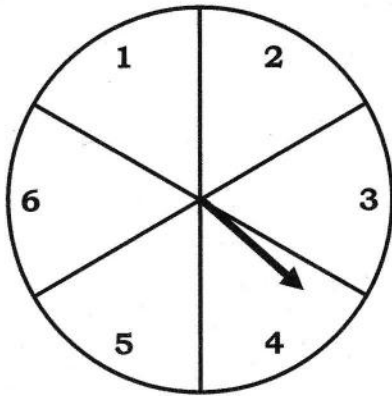
(f) What is the probability that Abdi scores a whole number?

1

2.

Bruno has two fair spinners, pictured below.

He is going to spin both spinners and add together the numbers to get a final score.



(a) Complete the sample space diagram below.

| + | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|----|----|----|----|----|
| 1 | 4 | 5 | 6 | 7 | 8 | 9 |
| 2 | 5 | 6 | 7 | 8 | 9 | 10 |
| 3 | 6 | 7 | 8 | 9 | 10 | 11 |
| 4 | 7 | 8 | 9 | 10 | 11 | 12 |
| 5 | 8 | 9 | 10 | 11 | 12 | 13 |
| 6 | 9 | 10 | 11 | 12 | 13 | 14 |

(b) What is the probability that Bruno scores 5?

$$\frac{2}{36} = \frac{1}{18}$$

(c) What is the probability that Bruno scores a two-digit number?

$$\frac{15}{36} = \frac{5}{12}$$

(d) What is the probability that Bruno scores a one-digit number?

$$\frac{19}{36}$$

3.

Chloe has two fair six-sided dice.

She is going to roll them both and multiply the scores together to get a final score.

(a) In the space below, construct a sample space diagram.

| | | | | | | |
|---|---|----|----|----|----|----|
| X | 1 | 2 | 3 | 4 | 5 | 6 |
| 1 | 1 | 2 | 3 | 4 | 5 | 6 |
| 2 | 2 | 4 | 6 | 8 | 10 | 12 |
| 3 | 3 | 6 | 9 | 12 | 15 | 18 |
| 4 | 4 | 8 | 12 | 16 | 20 | 24 |
| 5 | 5 | 10 | 15 | 20 | 25 | 30 |
| 6 | 6 | 12 | 18 | 24 | 30 | 36 |

(b) What is the probability that Chloe scores less than 14?

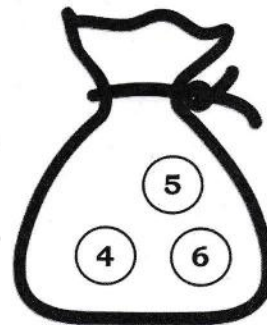
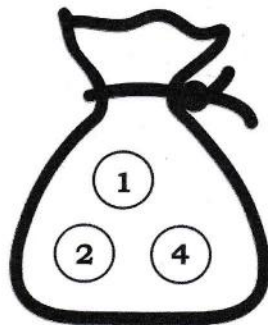
$$\frac{23}{36}$$

(c) What is the probability that Chloe scores a double-digit number?

$$\frac{19}{36}$$

4.

David has two bags of counters, pictured below.



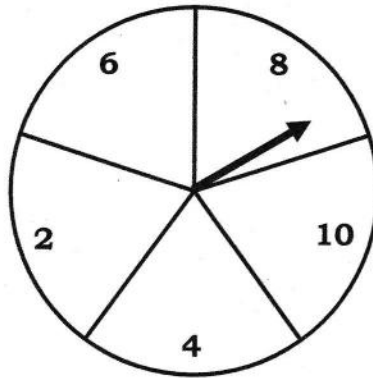
He is going to pick a counter from each bag and multiply the numbers together to get a final score.

In the space below, construct a sample space diagram.

| | | | |
|---|---|----|----|
| X | 1 | 2 | 4 |
| 5 | 5 | 10 | 20 |
| 4 | 4 | 8 | 16 |
| 6 | 6 | 12 | 24 |

5.

Eddie has a fair ~~six-sided~~ spinner, pictured below, and a fair coin.



He is going to spin the spinner and flip the coin.

If the coin lands on heads, he will double the number on the spinner to get his final score.

If the coin lands on tails, he will halve the number on the spinner to get his final score.

(a) In the space below, construct a sample space diagram.

| | | COIN | |
|---------|----|------|---|
| | | H | T |
| SPINNER | 6 | 12 | 3 |
| | 8 | 16 | 4 |
| | 10 | 20 | 5 |
| | 2 | 4 | 1 |
| | 4 | 8 | 2 |

(b) What is the probability that Eddie scores 4?

$$\frac{2}{10} = \frac{1}{5}$$

(c) What is the probability that Eddie scores an odd number?

$$\frac{3}{10}$$

(d) What is the probability that Eddie scores more than 5?

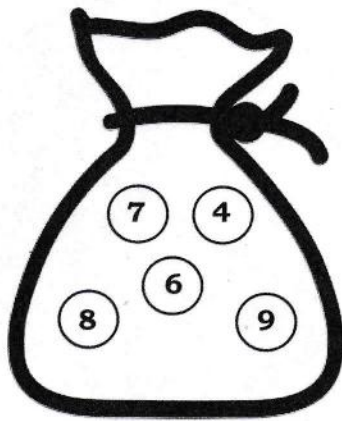
$$\frac{4}{10} = \frac{2}{5}$$

(e) What is the probability that Eddie scores a multiple of 4?

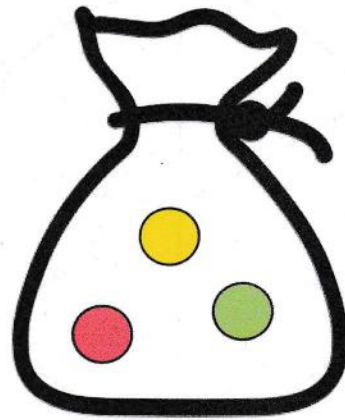
$$\frac{6}{10} = \frac{3}{5}$$

6.

Farrah has two bags of counters, pictured below.



Bag 1



Bag 2

She is going to pick a counter from both bags.

If she picks a red counter from Bag 2, she will add 2 to the number picked from Bag 1 to get her final score.

If she picks a yellow counter from Bag 2, she will take away 2 from the number picked from Bag 1 to get her final score.

If she picks a green counter from Bag 2, she her final score is the number picked from Bag 1.

(a) In the space below, construct a sample space diagram.

BAG 2

| | Yellow | Red | Green |
|---|--------|-----|-------|
| 4 | 2 | 6 | 4 |
| 6 | 4 | 8 | 6 |
| 7 | 5 | 9 | 7 |
| 8 | 6 | 10 | 8 |
| 9 | 7 | 11 | 9 |

BAG 1

(b) What is probability that Farrah scores 5?

$$\frac{3}{15} = \frac{1}{5}$$

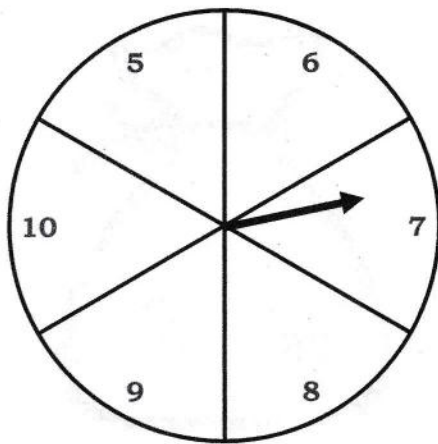
(c) What is the probability that Farrah scores an even number?

$$\frac{9}{15} = \frac{3}{5}$$

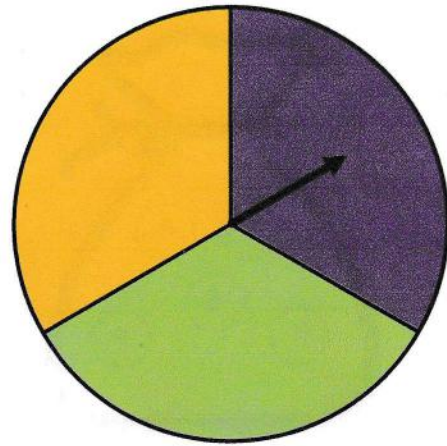
(d) What is the probability that Farrah scores a prime number?

$$\frac{5}{15} = \frac{1}{3}$$

7.
Gavin has a two fair spinners, pictured below.



Spinner 1



Spinner 2

He is going to spin both spinners.

If Spinner 2 lands on yellow, he will multiply the number from Spinner 1 by 2.

If Spinner 2 lands on purple, he will subtract 2 from the number from Spinner 1.

If Spinner 2 lands on green, the number from Spinner 1 stays the same.

(a) In the space below, construct a sample space diagram.

| | | SPINNER 2 | | |
|-----------|----|-----------|--------|-------|
| | | Orange | Purple | Green |
| SPINNER 1 | 5 | 10 | 3 | 5 |
| | 6 | 12 | 4 | 6 |
| | 7 | 14 | 5 | 7 |
| | 8 | 16 | 6 | 8 |
| | 9 | 18 | 7 | 9 |
| | 10 | 20 | 8 | 10 |

(b) What is the probability that Gavin scores 10?

$$\frac{2}{18} = \frac{1}{9}$$

(c) What is the probability that Gavin scores an odd number?

$$\frac{6}{18} = \frac{1}{3}$$

(d) What is the probability that Gavin scores a two-digit number?

$$\frac{7}{18}$$

8.

Harry has two fair six-sided dice.

He is going to roll both dice.

The final score is the larger of the two numbers.

If both dice land on the same number, the score is doubled.

Work out the probability of scoring a number more than 5.

| | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|----|----|
| 1 | 2 | 2 | 3 | 4 | 5 | 6 |
| 2 | 2 | 4 | 3 | 4 | 5 | 6 |
| 3 | 3 | 3 | 6 | 4 | 5 | 6 |
| 4 | 4 | 4 | 4 | 8 | 5 | 6 |
| 5 | 5 | 5 | 5 | 5 | 10 | 6 |
| 6 | 6 | 6 | 6 | 6 | 6 | 12 |

$$\frac{14}{36} = \frac{7}{18}$$

9.

Irina has a fair six-sided dice and a fair coin.

She is going to roll the dice and flip the coin.

If the coin lands on heads, she multiplies the score on the dice by 2.

If the coin lands on tails, she multiplies the score on the dice by 3.

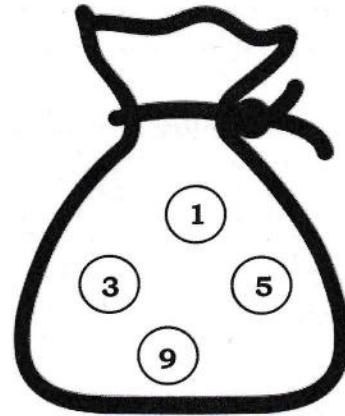
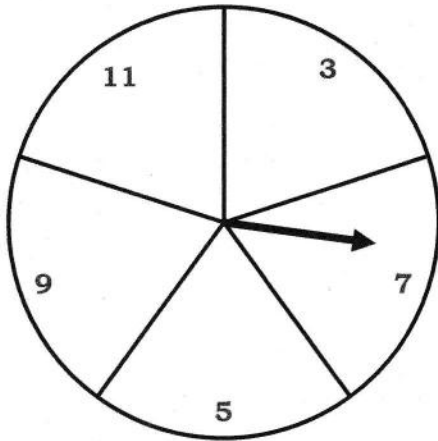
Work out the probability of scoring a multiple of 4.

| | | COIN | |
|------|---|------|----|
| | | H | T |
| DICE | 1 | 2 | 3 |
| | 2 | 4 | 6 |
| | 3 | 6 | 9 |
| | 4 | 8 | 12 |
| | 5 | 10 | 15 |
| | 6 | 12 | 18 |

$$\frac{4}{12} = \frac{1}{3}$$

10.

Jay has a fair spinner and a bag of counters, pictured below.



He is going to spin the spinner and pick a counter from the bag. The final score is the average of the two numbers.

Work out the probability of scoring a prime number.

SPINNER

| | 3 | 5 | 7 | 9 | 11 |
|---|---|---|---|---|----|
| 1 | 2 | 3 | 4 | 5 | 6 |
| 3 | 3 | 4 | 5 | 6 | 7 |
| 5 | 4 | 5 | 6 | 7 | 8 |
| 9 | 6 | 7 | 8 | 9 | 10 |

BAG

$$\frac{9}{20}$$