

- ☐ .01176210
- ☐ .00182220

✓ correct

There are $6! = 720$ permutations where each face occurs exactly once.

There are $6 \times 6 \times 6 \times 6 \times 6 \times 6 = 46656$ total permutations of 6 thrown.

The probability is therefore $\frac{720}{46656} = 0.01543210$

7. On 1 day in 1000, there is a fire and the fire alarm rings.

0.7 correct

On 1 day in 100, there is no fire and the fire alarm rings (false alarm)

On 1 day in 10,000, there is a fire and the fire alarm does not ring (defective alarm).

On 6,889 days out of 10,000, there is no fire and the fire alarm does not ring.

If the fire alarm rings, what is the (conditional) probability that there is a fire?

Writers: if there is a fire | fire alarm rings

- ☐ 1.12%
- ☐ 96.9%
- ☒ 8.06%
- ☐ 1.1%

✓ correct

10 days out of every 10,000 there is fire and the fire alarm rings.

100 days out of every 10,000 there is no fire and the fire alarm rings.

110 days out of every 10,000 the fire alarm rings.

The probability that there is a fire, given that the fire alarm rings, is $\frac{10}{110} = 9.09\%$

8. On 1 day in 1000, there is a fire and the fire alarm rings.

0.7 correct

On 1 day in 100, there is no fire and the fire alarm rings (false alarm)

On 1 day in 10,000, there is a fire and the fire alarm does not ring (defective alarm).

On 6,889 days out of 10,000, there is no fire and the fire alarm does not ring.

If the fire alarm does not ring, what is the (conditional) probability that there is a fire?

pe there is a fire | fire alarm does not ring

- ☐ .01000%
- ☐ 1.0001%
- ☒ 0.0001%
- ☐ .00011%

✓ correct

On 11 + 9,889 = 9,900 days out of every 10,000 the fire alarm does not ring.

On 1 of those 10,000 days there is a fire.

$\frac{1}{9900} = 0.00011\%$

9. A group of 45 civil servants at the State Department are evenly split as to serve as Ambassadors. How many distinct groups of 22 people can the President promote to fill these jobs?

0.7 correct

☒ $844,1167$ times (10^{12})

☐ $+2,429 \times 10^{+13}$

☐ $+1.06 \times 10^{12} 35$

☐ 8.238 times (10^{13})

✓ correct

$$\begin{aligned} & \binom{45}{22} \\ &= 45! / (22! \times 23!) \\ &= \frac{45!}{23! \times 22!} \end{aligned}$$