Worked Solutions for ENGAA Papers by Topic

Section 1

Topic: Probability

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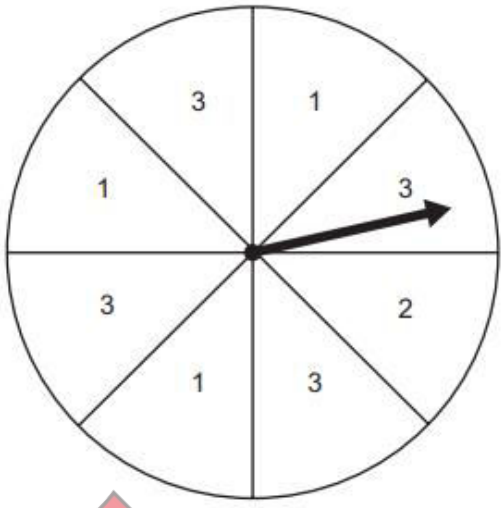
ENGAA S1 2020 - Question 4

4 A fair spinner has eight equal sections.

Each section has one number written on it, as shown.



The spinner is spun twice, and the two numbers scored are added.

What is the probability that the sum of the two numbers is 5?

A $\frac{1}{8}$

B $\frac{5}{8}$

C $\frac{1}{16}$

D $\frac{3}{16}$

E $\frac{25}{64}$

F $\frac{55}{64}$

ENGAA S1 2020 - Question 4 - Worked Solution

$$P(5) = P(3) \times P(2) + P(2) \times P(3)$$
$$= \frac{1}{16} + \frac{1}{16}$$
$$= \frac{1}{8}$$

Answer is A

ENGAA S1 2018 - Question 27

27 A bag contains 6 red and 6 green sweets. The sweets are identical apart from their colour.

A child takes a sweet at random from the bag.

If the sweet is red, the child stops taking sweets.

If the sweet is green, it is not replaced and the child takes another sweet.

This continues until a red sweet is taken at which point the child stops taking sweets.

What is the probability that the child takes **more** green sweets than red sweets?

A $\frac{3}{22}$

B $\frac{5}{22}$

C $\frac{3}{11}$

D $\frac{1}{2}$

E $\frac{8}{11}$

F $\frac{17}{22}$

ENGAA S1 2018 - Question 27 - Worked Solution

Child takes move green than red it takes at least two green in a row

$$P(C > R) = P(at\ least\ two\ green\ in\ a\ row)$$
$$= 1 - \left(P(zero\ green) + P(1\ green)\right)$$
$$= 1 - \left[\frac{6}{12} + \frac{6}{12} \times \frac{6}{11}\right]$$
$$= 1 - \frac{17}{22}$$
$$= \frac{5}{22}$$

Answer is B.

ENGAA S1 2017 - Question 23

23 A pet shop has 4 female rabbits and x male rabbits for sale.

A customer buys 2 of the rabbits, chosen at random, and each rabbit is equally likely to be chosen.

The probability that both the chosen rabbits are male is $\frac{1}{3}$.

What is the value of x?

A 2

B 4

C 6

D 8

E 9

F 11

G 12

ENGAA S1 2017 - Question 23 - Worked Solution

$$p(male) = \frac{x}{4+x} \times \frac{x-1}{4+x-1} = \frac{1}{3}$$

$$\Rightarrow 3x(x-1) = (4+x)(3+x)$$

$$\Rightarrow 3x^2 - 3x = 12 + 7x + x^2$$

$$\Rightarrow 2x^2 - 10x - 12 = 0$$

$$\Rightarrow x^2 - 5x - 6 = 0$$

$$(x-6)(x+1) = 0$$

$$\Rightarrow x = 6 \quad or \quad -1 \qquad (x \geq 0)$$

$$x = 6$$

Answer is C