

*Odd problems worked out, even just answers

Geometry

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8.3 - Mutually Exclusive & Overlapping

Determine if the scenario involves mutually exclusive events. Then find the probability.

- 1) A box contains six red playing cards numbered one to six. The box also contains six black playing cards numbered one to six. You randomly pick a playing card. It is red or has an even number.

overlapping

$$\frac{6}{12} + \frac{6}{12} - \frac{3}{12} = \frac{9}{12} = \frac{3}{4}$$

- 2) A basket contains six apples and four peaches. Two of the apples and three of the peaches are rotten. You randomly pick a piece of fruit. It is fresh or it is an apple.

overlapping

$$\frac{7}{10}$$

- 3) A litter of kittens consists of two gray females, one gray male, two black females, and two black males. You randomly pick one kitten. The kitten is black or male.

overlapping

F M F M
F F M M

$$\frac{4}{7} + \frac{3}{7} - \frac{2}{7} = \frac{5}{7}$$

- 4) A bag contains six yellow tickets numbered one to six. The bag also contains three green tickets numbered one to three. You randomly pick a ticket. It is green or has an even number.

overlapping

$$\frac{2}{3}$$

- 5) A magazine contains twelve pages. You open to a random page. The page number is two or six.

mutually exclusive

$$\frac{1}{12} + \frac{1}{12} - \frac{0}{12} = \frac{2}{12} = \frac{1}{6}$$

- 6) A basket contains five apples, four peaches, and three pears. You randomly select a piece of fruit. It is an apple or a peach.

mutually exclusive

$$\frac{3}{4}$$

- 7) A litter of kittens consists of three gray kittens, two black kittens, and three mixed-color kittens. You randomly pick one kitten. The kitten is gray or mixed-color.

mutually exclusive

G B M
G B M
G M

$$\frac{3}{8} + \frac{3}{8} = \frac{6}{8} = \frac{3}{4}$$

- 8) A litter of kittens consists of three gray kittens, two black kittens, and two mixed-color kittens. You randomly pick one kitten. The kitten is gray or mixed-color.

mutually exclusive

$$\frac{5}{7}$$

- 9) A box of chocolates contains seven milk chocolates and seven dark chocolates. One of the milk chocolates and one of the dark chocolates have peanuts inside. You randomly select and eat a chocolate. It is a milk chocolate or has peanuts inside.

overlapping

m D
M D
m D
m D
m D
m D
m P DP

$$\frac{7}{14} + \frac{2}{14} - \frac{1}{14} = \frac{8}{14} = \frac{4}{7}$$

- 11) A litter of kittens consists of three gray kittens, two black kittens, and three mixed-color kittens. You randomly pick one kitten. The kitten is gray or mixed-color.

Do not do, same as #7

- 13) You roll a fair six-sided die. The die shows an even number or a number less than four.

overlapping

1
2
3
4
5
6

$$\frac{3}{6} + \frac{3}{6} - \frac{1}{6} = \frac{5}{6}$$

- 15) A magazine contains fourteen pages. You open to a random page. The page number is four or twelve.

mutually exclusive

$$\frac{1}{14} + \frac{1}{14} - \frac{0}{14} = \frac{2}{14} = \frac{1}{7}$$

- 17) You roll a fair six-sided die. The die shows a one or a four

mutually exclusive

$$\frac{1}{6} + \frac{1}{6} - \frac{0}{6} = \frac{2}{6} = \frac{1}{3}$$

- 10) There are four nickels, five dimes, and three quarters in your pocket. You randomly pick a coin. It is a nickel or a dime.

mutually exclusive

$$\frac{3}{4}$$

- 12) A box contains three red playing cards numbered one to three. The box also contains six black playing cards numbered one to six. You randomly pick a playing card. It is red or has an even number.

overlapping

$$\frac{2}{3}$$

- 14) A magazine contains fifteen pages. You open to a random page. The page number is nine or thirteen.

mutually exclusive

$$\frac{2}{15}$$

- 16) A litter of kittens consists of three gray females, one gray male, three black females, and one black male. You randomly pick one kitten. The kitten is black or male.

overlapping

$$\frac{5}{8}$$

- 18) A basket contains six apples and five peaches. Five of the apples and two of the peaches are rotten. You randomly pick a piece of fruit. It is fresh or it is a peach.

overlapping

$$\frac{6}{11}$$