NAME ANSWER KEY DATE _____ PERIOD ALL

PROBABILITY

A bag contains **2 green, 9 brown, 7 yellow,** and **4 blue marbles.** Once a marble is selected, it is **not replaced.** Find each probability. $2+9+7+4=22$

1. *P*(brown, then yellow)
P(brown) · P(yellow)
$\frac{9}{22} \cdot \frac{7}{21} = \frac{63}{462} = \boxed{\frac{3}{22}}$ or $\boxed{13.6\%}$

2. *P*(green, then blue) → P(green) · P(blue)
$\frac{2}{22} \cdot \frac{4}{21} = \frac{6}{462} = \boxed{\frac{1}{77}}$ or $\boxed{1.3\%}$

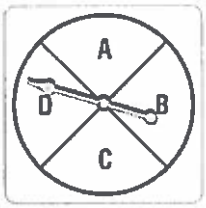
3. *P*(yellow, then yellow)
$\frac{7}{22} \cdot \frac{6}{21} = \boxed{\frac{1}{11}}$ or $\boxed{9.1\%}$

4. *P*(blue, then blue)
$\frac{4}{22} \cdot \frac{3}{21} = \frac{12}{462} = \boxed{\frac{2}{77}}$ or $\boxed{2.6\%}$

5. *P*(green, then *not* blue)
$\frac{2}{22} \cdot \frac{1+9+7}{21} = \frac{2}{22} \cdot \frac{17}{21} = \frac{34}{462}$
$\boxed{\frac{17}{231}}$ or $\boxed{7.4\%}$

6. *P*(brown, then *not* green)
$\frac{9}{22} \cdot \frac{8+7+4}{21} = \frac{9}{22} \cdot \frac{19}{21} = \boxed{\frac{57}{154}}$ or $\boxed{37.0\%}$

A **die** is rolled and a **spinner** like the one at the right is spun. Find each probability.



7. *P*(4 and A) → P(4) · P(A)
$\frac{1}{6} \cdot \frac{1}{4} = \boxed{\frac{1}{24}}$ or $\boxed{4.2\%}$

8. *P*(an even number and C)
$\frac{3}{6} \cdot \frac{1}{4} = \frac{3}{24} = \boxed{\frac{1}{8}}$ or $\boxed{12.5\%}$

9. *P*(2 or 5 and B or D)
$\frac{2}{6} \cdot \frac{2}{4} = \frac{4}{24} = \boxed{\frac{1}{6}}$ or $\boxed{16.7\%}$

10. *P*(a number less than 5 and B, C, or D)
$\frac{4}{6} \cdot \frac{3}{4} = \frac{12}{24} = \boxed{\frac{1}{2}}$ or $\boxed{50\%}$

A **card** is being drawn from a **standard deck** of playing cards *(52 total cards; 2 colors of red and black; 4 suits of hearts, diamonds, spades, and clubs; numbers 2-10 with Jack, Queen, King, and Ace in each suit).* Determine whether the events are ***mutually exclusive*** or ***not*** **mutually exclusive.** Then **find the probability.**

11. *P*(jack or ten)
(M.E.)
$\frac{4}{52} + \frac{4}{52} = \frac{8}{52} = \boxed{\frac{2}{13}}$ or $\boxed{15.4\%}$

12. *P*(red or black) (M.E.)
$\frac{26}{52} + \frac{26}{52} = \frac{52}{52} = \boxed{100\%!}$

13. *P*(queen or club)
(not M.E.)
$\frac{4}{52} + \frac{13}{52} - \frac{1}{52} = \frac{16}{52} = \boxed{\frac{4}{13}}$ or $\boxed{30.8\%}$

14. *P*(red or ace)
(not M.E.)
$\frac{26}{52} + \frac{4}{52} - \frac{2}{52} = \frac{28}{52} = \boxed{\frac{7}{13}}$ or $\boxed{53.8\%}$

15. *P*(diamond or black)
(M.E.)
$\frac{13}{52} + \frac{26}{52} = \frac{39}{52} = \boxed{\frac{3}{4}}$ or $\boxed{75\%}$

16. *P*(face card or spade) (not M.E.)
$\frac{12}{52} + \frac{13}{52} - \frac{4}{52} = \boxed{\frac{21}{52}}$ or $\boxed{40.4\%}$

OVER FOR MORE! →

Tiles numbered 1 through 20 are placed in a box. **Tiles numbered 11 through 30** are placed in a second box. The first tile is randomly drawn from the first box. The second tile is randomly drawn from the second box. Find each probability.

17. *P*(both are greater than 15)

$\frac{5}{20} \cdot \frac{15}{20} = \boxed{\frac{3}{16}}$ or $\boxed{18.6\%}$

18. The first tile is odd and the second tile is less than 25.

don't include 25!

$P(\text{odd}) \cdot P(<25)$

$\frac{10}{20} \cdot \frac{14}{20} = \boxed{\frac{7}{20}}$ or $\boxed{35\%}$

19. The first tile is a multiple of 6 and the second tile is a multiple of 4. (6, 12, 18) (12, 16, 20, 24, 28)

$\frac{3}{20} \cdot \frac{5}{20} = \frac{15}{400} = \boxed{\frac{3}{80}}$ or $\boxed{3.8\%}$

20. The first tile is less than 15 and the second tile is even or greater than 25.

$P(<15) \cdot P(\text{even or } >25)$

$\frac{14}{20} \cdot (P(\text{even}) + P(>25))$

$\frac{14}{20} \cdot \left(\frac{10}{20} + \frac{5}{20}\right) = \frac{14}{20} \cdot \frac{15}{20}$

$= \boxed{\frac{21}{40}}$

or $\boxed{52.5\%}$