

Date: \_\_\_\_\_

**KEY**

## 11.3 Notes: Determining Probability Using Fractions

Vladimir is rolling a die and flipping a coin. Yuri wants to find out the probability of getting a Heads and a 6.

	1	2	3	4	5	6
H	H, 1	H, 2	H, 3	H, 4	H, 5	H, 6
T	T, 1	T, 2	T, 3	T, 4	T, 5	T, 6

What is the probability of getting a H and a 6 on the same toss?

$$P(H, 6) = \frac{1}{12}$$

3 outcomes  
for T, Even

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

$$= \frac{1}{4} \quad (\checkmark)$$

Find the probability of each event separately:

$$P(H) = \frac{1}{2}$$

$$P(6) = \frac{1}{6}$$

What do you notice about the  $P(H, 6)$  compared to  $P(H)$  and  $P(6)$ ?

it's the product.

$$P(H, 6) = P(H) \times P(6)$$

Can you calculate the  $P(T, \text{Even Number})$  using  $\frac{P(T) \times P(\text{Even})}{?}$ ?

$$\begin{aligned} P(T, \text{Even}) &= \frac{1}{2} \times \frac{3}{6} \\ &= \frac{1}{2} \times \frac{1}{2} \end{aligned}$$

$$P(T, \text{Even}) = \frac{1}{4}$$

Calculate each of the following by multiplication:

$$\begin{aligned} \text{a) } P(H, >3) &= P(H) \times P(>3) \\ &= \frac{1}{2} \times \frac{3}{6} \end{aligned} \quad \left| \quad \begin{aligned} P(H, >3) &= \frac{1}{2} \times \frac{1}{2} \\ P(H, >3) &= \frac{1}{4} \end{aligned} \right.$$

$$\begin{aligned} \text{b) } P(T, <6) &= \frac{1}{2} \times \frac{1}{6} \\ &= \frac{1}{12} \end{aligned}$$

Yuri adds a spinner with 3 coloured sections (blue, red, yellow) to their game.

What is  $P(T, 4, \text{red})$ ?

$$P(T, 4, \text{red}) = \frac{1}{2} \times \frac{1}{6} \times \frac{1}{3}$$

$$P(T, 4, \text{red}) = \frac{1}{36}$$



Mary Mary Quite Contrary guesses at both questions on her true and false test. She has a 70% chance of guessing correctly on the first question, but only a 50% chance of guessing correctly on the second. What is the probability that she guesses correct on both?

$$\begin{aligned} P(C, C) &= P(C) \times P(C) \\ &= 70\% \times 50\% \\ &= 0.7 \times 0.5 \end{aligned}$$

$$\boxed{\text{or } 35\%}$$

$$\boxed{P(C, C) = 0.35}$$

Richie Rich has a pocketful of coins. He has 15 quarters and 5 loonies in his pocket. In his other pocket he has 3 quarters and 6 toonies. If he pulls one coin out of each pocket, what is the probability that he has \$3.



Pocket #1

$$P(Q) = \frac{3}{4}$$

$$P(L) = \frac{1}{4}$$

Pocket #2

$$P(Q) = \frac{1}{3}$$

$$P(T) = \frac{2}{3}$$

$$\begin{aligned} P(L, T) &= P(L) \times P(T) \\ &= \frac{1}{4} \times \frac{2}{3} \\ &= \frac{2}{12} \end{aligned}$$

To "win", he must get L, T.

$$\boxed{P(L, T) = \frac{1}{6}}$$



Pavel has two bags of marbles. One bag contains 5 blue, 2 yellow and a black. He has a 20% chance drawing a blue marble from the second bag. Find the probability that he will have 2 blue marbles if he draws one marble from each bag.

BAG 1

$$P(\text{blue}) = \frac{5}{8}$$

BAG 2

$$\begin{aligned} P(\text{blue}) &= 20\% \\ &= \frac{1}{5} \end{aligned}$$

$$\begin{aligned} P(\text{blue, blue}) &= P(\text{blue}) \times P(\text{blue}) \\ &= \frac{5}{8} \times \frac{1}{5} \end{aligned}$$

$$\boxed{P(\text{blue, blue}) = \frac{1}{8}}$$