

# QUIZ 7

NAME: \_\_\_\_\_

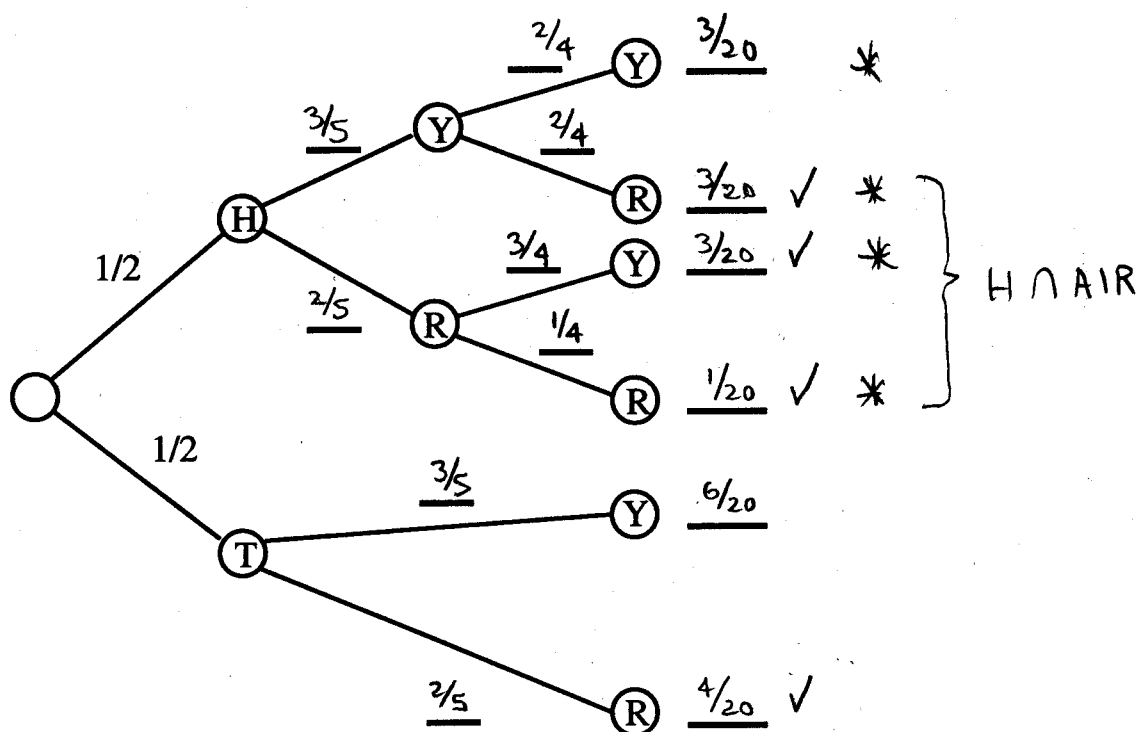
1) A vase holds 3 yellow and 2 red flowers. You perform the following steps in the order given.

- 1) Flip a fair coin and note the result (heads or tails).
- 2) If the result of step 1) is a HEADS then draw two flowers out of the vase noting order and color
- 2') If the result of step 1) is a TAILS then draw one flower out of the vase noting its color.

Your record might show, for example, (H, Y, R) to indicate that you flipped heads then drew out a yellow and then a red flower.

a) (15 PTS.) Fill in the blanks on the following tree where the numbers in the right hand column indicate the probability of the corresponding outcome. One point per blank.

For example, the number that goes in right here is the probability of flipping a heads then drawing a yellow and then a yellow flower.



b) (15 PTS.) Find the probability that at least one of the flowers drawn is red (i.e. probability of getting one or more red flowers).

✓ ~ at least one red  
AIR

$$\frac{3}{20} + \frac{3}{20} + \frac{1}{20} + \frac{1}{20} = \frac{11}{20}$$

Answer:  $Pr[\text{At least one RED}] = \frac{11}{20}$

c) (20 PTS.) Find the probability that the coin toss came up heads given that at least one of the flowers drawn is red.

✗ ~ Heads

$$Pr(H|AIR) = \frac{Pr(H \cap AIR)}{Pr(AIR)} = \frac{3/20 + 3/20 + 1/20}{11/20} = \frac{7}{11}$$

Answer:  $Pr[\text{HEADS given at least ONE RED}] = \frac{7}{11}$

# QUIZ 7

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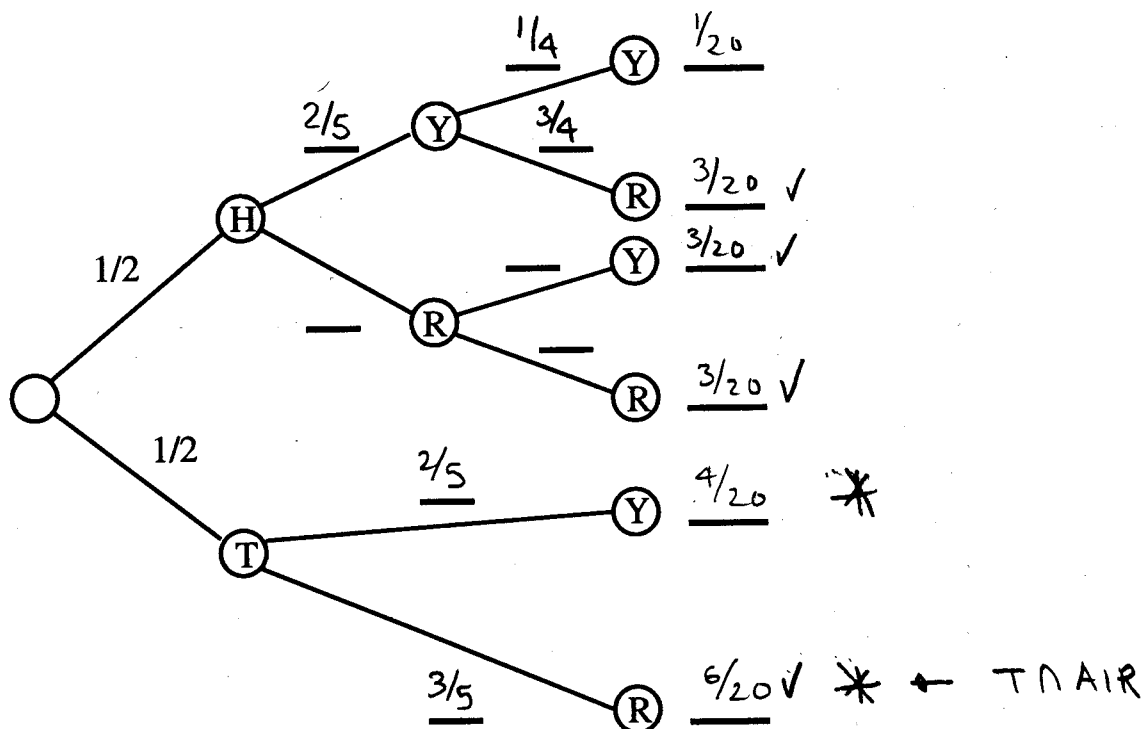
- 1) A vase holds 2 yellow and 3 red flowers. You perform the following steps in the order given.

- 1) Flip a fair coin and note the result (heads or tails).
- 2) If the result of step 1) is a HEADS then draw two flowers out of the vase noting order and color
- 2') If the result of step 1) is a TAILS then draw one flower out of the vase noting its color.

Your record might show, for example, (H,Y,R) to indicate that you flipped heads then drew out a yellow and then a red flower.

- a) (15 PTS.) Fill in the blanks on the following tree where the numbers in the right hand column indicate the probability of the corresponding outcome. One point per blank.

For example, the number that goes in right here is the probability of flipping a heads then drawing a yellow and then a yellow flower.



- b) (15 PTS.) Find the probability that at least one of the flowers drawn is red (i.e. probability of getting one or more red flowers).

$$\checkmark \sim \text{at least one red} \quad \frac{3}{20} + \frac{3}{20} + \frac{3}{20} + \frac{6}{20} = \frac{15}{20} = \frac{3}{4}$$

AIR

Answer:  $Pr[\text{At least one RED}] = \frac{3}{4}$

- c) (20 PTS.) Find the probability that the coin toss came up tails given that at least one of the flowers drawn is red.

$$* \sim \text{TAILS} \quad Pr(T|AIR) = \frac{Pr(T \cap AIR)}{Pr(AIR)} = \frac{\frac{6}{20}}{\frac{15}{20}} = \frac{6}{15} = \frac{2}{5}$$

Answer:  $Pr[\text{TAILS given at least ONE RED}] = \frac{2}{5}$

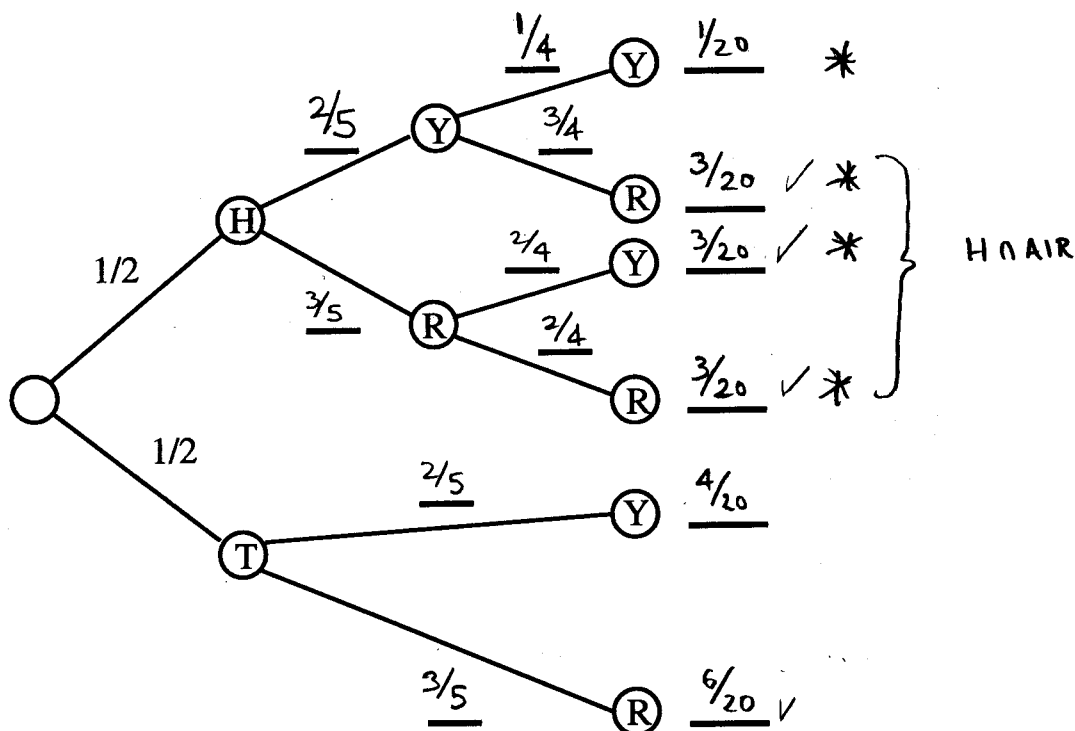
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Your record might show, for example, (H, Y, R) to indicate that you flipped heads then drew out a yellow and then a red flower.

- a) (15 PTS.) Fill in the blanks on the following tree where the numbers in the right hand column indicate the probability of the corresponding outcome. One point per blank.

For example, the number that goes in right here is the probability of flipping a heads then drawing a yellow and then a yellow flower.



- b) (15 PTS.) Find the probability that at least one of the flowers drawn is red (i.e. probability of getting one or more red flowers).

✓ ~ at least one red  
AIR

$$\frac{3}{20} + \frac{3}{20} + \frac{3}{20} + \frac{6}{20} = \frac{15}{20} = \frac{3}{4}$$

Answer:  $Pr[\text{At least one RED}] = \frac{3}{4}$

- c) (20 PTS.) Find the probability that the coin toss came up heads given that at least one of the flowers drawn is red.

\* ~ HEADS

$$Pr(H|\text{AIR}) = \frac{Pr(H \cap \text{AIR})}{Pr(\text{AIR})} = \frac{\frac{3}{20} + \frac{3}{20} + \frac{3}{20}}{\frac{15}{20} \leftarrow \text{from b)}} = \frac{9}{15}$$

Answer:  $Pr[\text{HEADS given at least ONE RED}] = \frac{3}{5}$

# QUIZ 7

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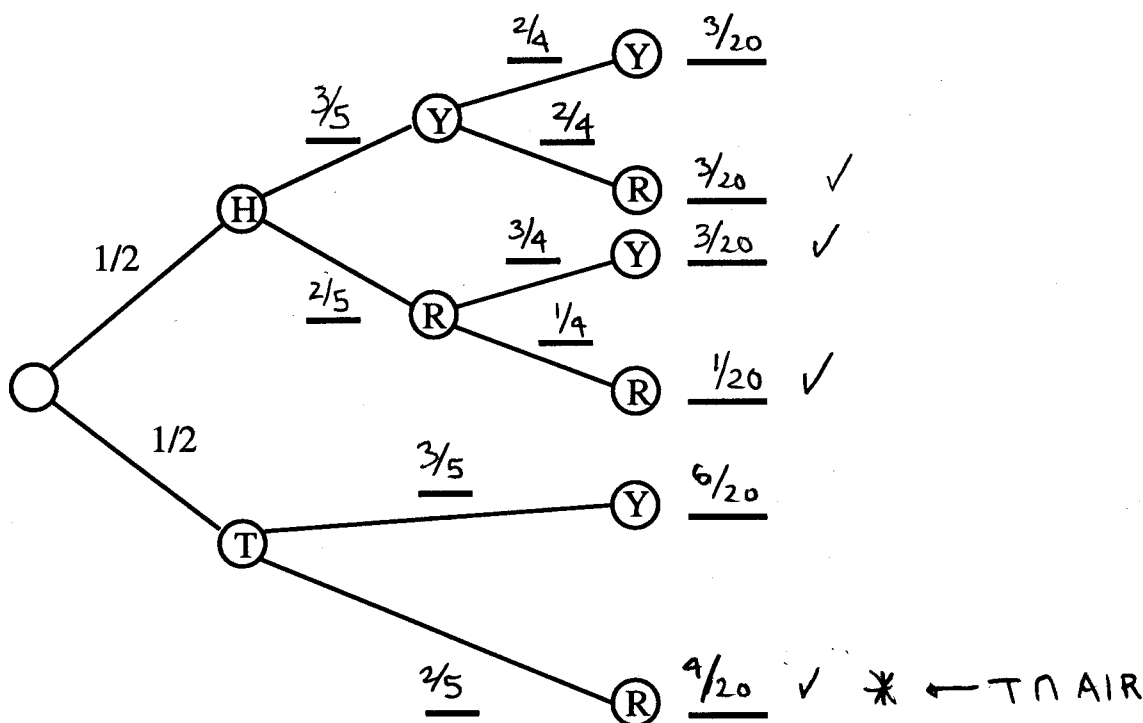
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- 1) Flip a fair coin and note the result (heads or tails).
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For example, the number that goes in right here is the probability of flipping a heads then drawing a yellow and then a yellow flower.



- b) (15 PTS.) Find the probability that at least one of the flowers drawn is red (i.e. probability of getting one or more red flowers).

$\checkmark \sim \underbrace{\text{at least one red}}_{\text{AIR}}$

$$\frac{3}{20} + \frac{3}{20} + \frac{1}{20} + \frac{4}{20} = \frac{11}{20}$$

Answer:  $\Pr[\text{At least one RED}] = \frac{11}{20}$

- c) (20 PTS.) Find the probability that the coin toss came up tails given that at least one of the flowers drawn is red.

$* \sim \text{Tails}$

$$\Pr(T|\text{AIR}) = \frac{\Pr(T \cap \text{AIR})}{\Pr(\text{AIR})} = \frac{\frac{4}{20}}{\frac{11}{20}} = \frac{4}{11}$$

Answer:  $\Pr[\text{TAILS given at least ONE RED}] = \frac{4}{11}$