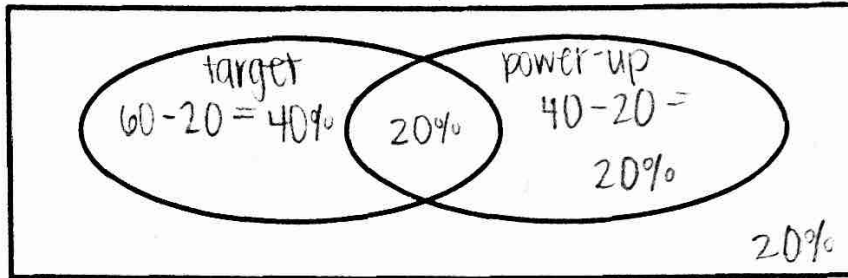


Victoria is still playing her video game. To get to the second level, she must hit a target with her blaster and capture a power-up.

- Victoria hits the target 60% of the time.
- Victoria captures a power up 40% of the time.
- She manages to both hit the target and capture a power up 20% of the time.

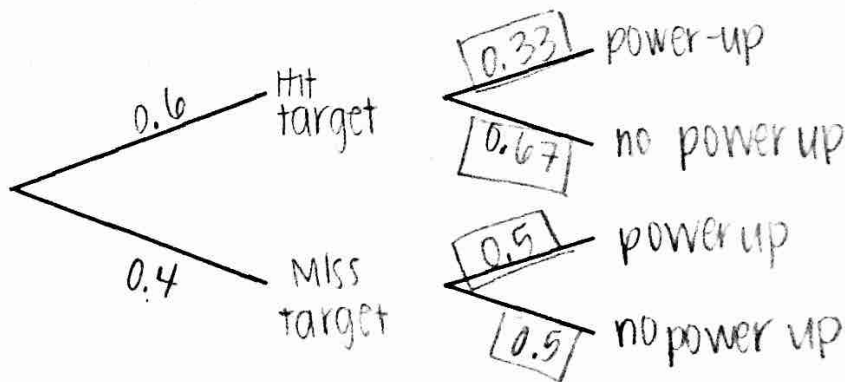
1. Complete a Venn Diagram, Tree Diagram, and Area Model to model these probabilities

Venn Diagram



probabilities

Tree Diagram



$$(0.6)(x) = 0.2$$

$$x = 0.33$$

$$1 - 0.33 = 0.67$$

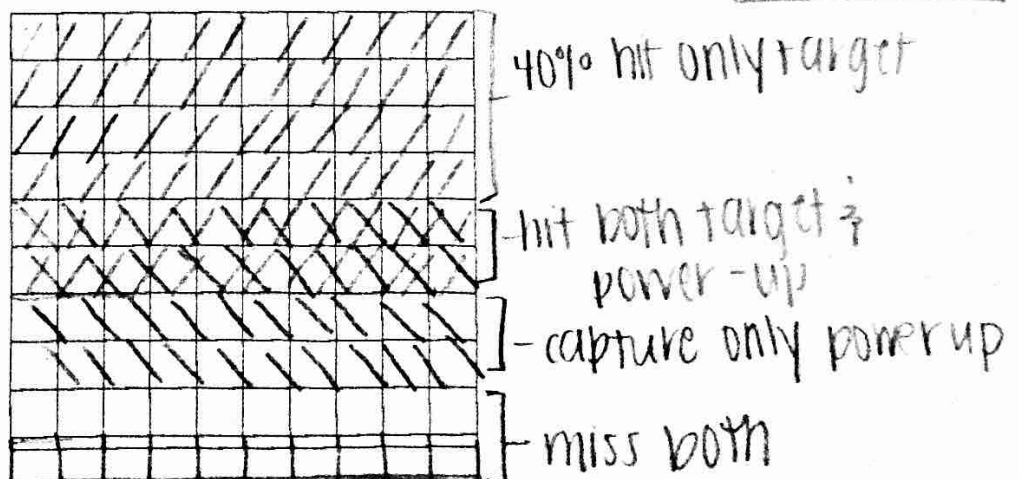
$$1 - 0.5 = 0.5$$

$$0.4(x) = 0.2$$

$$x = 0.5$$

Area Model

- hit target
- capture power up
- miss both



2. What part of the Venn Diagram represents Victoria making it to the next level? What is the probability?

the middle where she hits the target & captures the power-up. This has a probability of 20%.

3. Use the tree diagram to find the probability that Victoria will hit the target but not get the power-up. Show your calculations.

$$0.6 (0.67) = 0.402 = \boxed{40.2\%}$$

↑ misses
↑ hits target power-up

4. What is the probability that Victoria will get hit the target or get the power-up but not both? How can you use the area model to find this probability?

$$P(\text{only hits target}) + P(\text{only gets power-up})$$

40% + 20% = 60%

you can total the # of rows with $\sqrt{\quad}$ and \square but not where they overlap (since this means "both")

5. What is the probability that Victoria will accomplish neither task? Which model shows this most clearly and why?

$$P(\text{missing both}) = 20\%$$

Both models show this clearly, but I think the Venn diagram is easier to interpret.

$$\text{tree diagram} = (0.4)(0.5) = 0.2 = 20\%$$

↑ miss target
↑ miss power up