Team Name: _____

Group Members: _____

The 4077^{th} Mobile Army Surgical Hospital is considering the purchase of a helicopter to transport critical patients. The **probability distribution** of X, the number of patient helicopter transports per month, is determined from a similarly-sized army hospital as given by the probability distribution below.

Number of Helicopter Transports per Month

X	0	1	2	3	4	5	6
$P(X)$	0.15	0.20	0.34	0.19	0.06	0.05	0.01

For all of the following problems, include **probability notation**, label values with the appropriate **symbol**, show your **work**, and include **units** wherever applicable.

1. **Verify** that this is a valid discrete probability distribution.

2. Find the probability that a helicopter will **not be used** at all to transport patients in a month.

3. Find the probability that a helicopter will be used **at least once** to transport critical patients.

4. Find the **expected number** of times a helicopter will be used to transport critical patients each month. Show your work using the appropriate formula. (You should only use your calculator to <u>check</u> your work.)

5. **Interpret** the expected value in context of the problem.

6. Find the **standard deviation** of the number of times a helicopter will be used to transport critical patients in a month. Show your work using the appropriate formula. (Use your calculator to <u>check</u> your work.)

7. Build-a-Bear distributors claim that there is only a 2% chance that an unstuffed bear has a sewing defect. Your store received a shipment of 200 unstuffed bears. Let X = the number of bears with defects. Round all probabilities in the following problems to **four** decimal places.

   (a) What is the probability that **exactly** 10 bears have a defect? Show probability notation, the **binomial formula** with values plugged in, and your answer.

   (b) What is the probability that **at most** 10 bears have a defect? Show probability notation and your answer.

   (c) What is the probability that **at least two** bears have defects? Show probability notation and your answer.

   (d) What is the **expected number** of defective bears in your shipment? Include units, the appropriate symbol, and your calculations.

   (e) What is the **standard deviation** of defective bears in your shipment? Include units, the appropriate symbol, and your calculations.