Groomer's Challenge

Questions 1–6

Setup:
o three groomers: L M N
o 1-hour appointment slots: 8 9 10
o seven animals: P P P P T T W
o no more than one animal per appointment slot

Conditions:
#1: L ⟶ more animals than M and N
#2: T ⎫
   ⎪ ⎬ 1⁺
   P ⎭
#3: each groomer ⟶ 2⁺ types
#4: P_N10

#5: (T̶P̶)
#6: ~P_M first

Overview:
Combining the first and third conditions, we can infer a respective allocation of animals to L, M, and N of 3, 2, 2. From the third condition, and the fact that there are four Ps, we can infer that L grooms two Ps and each of M and N grooms one P. Since L grooms two Ps, the second and fifth conditions dictate that she must groom the Ps at 8 AM and 10 AM. The fifth condition further dictates that both Ts must be groomed at 9 AM. Since M must groom a P, Ps cannot be groomed at 9 AM (fifth condition), and M cannot groom a P at 8 AM (sixth condition), M must groom a P at 10 AM. The only uncertainty remaining about L's schedule is whether she grooms a T or the W at 9 AM, and we can set up three molds to represent all the acceptable solutions.

#1				**#2**				**#3**			
10	P	P	P	10	P	P	P	10	P	P	P
9	W	T	T	9	T	T	X|W	9	T	X|W	T
8	P	X	X	8	P	X	W|X	8	P	W|X	X
	L	M	N		L	M	N		L	M	N

Mold #1: If L grooms the W, M and T must each groom a T at 9, and they must therefore not have appointments at 8.

Mold #2: If L grooms a T and M grooms a T, N will groom the W at either 8 or 9.

Mold #3: If L grooms a T and P grooms a T, M will groom the W at either 8 or 9.

1. **(D)** As we inferred, M must be assigned exactly two animals, and choice D is therefore correct.

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2. **(B)** Comparing the choices to our molds reveals that only B must be false.

3. **(A)** Plugging this information into our molds reveals that only choice A must be true.

4. **(E)** Mold #1 is the only one of the three with only one solution. We based it on L grooming the W, and choice E is therefore correct.

5. **(C)** This is true of both molds #1 and #2. Since M cannot groom both a T and the W, choice C must be false.

6. **(E)** This doesn't change the fact that N must groom a P. Since none of the Ps can be groomed at 9, N must groom a P at 8. Thus, L and M must each groom a T at 9. Only choice E is not compatible with this solution, and it must therefore be false.

10	P	P	W
9	T	T	X
8	P	X	P
	L	M	N