

1. An animal acting agency has 5 dogs, 7 cats, and 2 birds waiting to audition. How many ways can these 14 animals be arranged in a line if:

(a) it does not matter which order the animals stand in.

(b) the dogs are at the front of the line, the cats are in the middle, and the birds are at the back.

2. Evaluate $\frac{12!}{9!}$

3. Consider the set $\{x \in \mathbb{Z} : 5 \mid x \text{ and } x \mid 60\}$.

(a) Write out the set by listing its elements between curly braces.

(b) Find the cardinality of the set.

4. For each of the following, write TRUE or FALSE (**not** T or F), as appropriate.

(a) $\frac{1}{2} \in \mathbb{Z}$

(b) $\{2, 3\} \in 2^{\{1,2,3,4\}}$

(c) $\{2, 3\} \subseteq 2^{\{1,2,3,4\}}$

1. An animal acting agency has 5 dogs, 8 cats, and 3 birds waiting to audition. How many ways can these 16 animals be arranged in a line if:

(a) it does not matter which order the animals stand in.

(b) the dogs are at the front of the line, the cats are in the middle, and the birds are at the back.

2. Evaluate $\frac{12!}{9!}$

3. Consider the set $\{x \in \mathbb{Z} : 5 \mid x \text{ and } x \mid 80\}$.

(a) Write out the set by listing its elements between curly braces.

(b) Find the cardinality of the set.

4. For each of the following, write TRUE or FALSE (**not** T or F), as appropriate.

(a) $\frac{1}{2} \in \mathbb{Z}$

(b) $\{2, 3\} \subseteq 2^{\{1,2,3,4\}}$

(c) $\{2, 3\} \in 2^{\{1,2,3,4\}}$