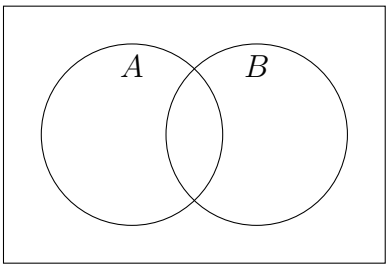
Do Now: Probability formulas, Venn diagrams

1. Given events A and B with $\mathrm{P}(A) = 0.5$, $\mathrm{P}(B) = 0.8$, $\mathrm{P}(A \cap B) = 0.4$.

   (a) Completely mark the Venn diagram with probabilities for each area.



   (b) Write down $\mathrm{P}(B')$.

   (c) Write down $\mathrm{P}(A \cap B')$.

   (d) Find $\mathrm{P}(A \cup B)$. (Do not just write a value. "Find" means you must show the substitution of values into the appropriate formula.)

   (e) State whether events A and B are independent. Justify your answer.

   (f) Find $\mathrm{P}(A|B)$. (again, show the substitution of values into a formula.)

2. The events A and B are independent with $\mathrm{P}(A) = 0.6$ and $\mathrm{P}(B) = 0.4$.

   (a) Find $\mathrm{P}(A \cap B)$.

   (b) Complete the data table of probabilities, including the totals column and row.

	A	A'	
B			
B'			

   (c) Find $\mathrm{P}(A \cup B)$.

   (d) Find $\mathrm{P}(B|A')$.

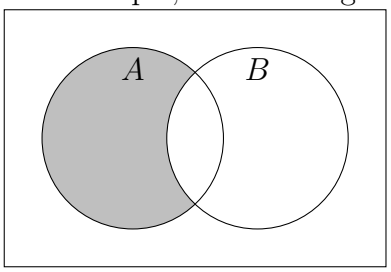
3. The events A and B are mutually exclusive with $\mathrm{P}(A) = 0.4$ and $\mathrm{P}(B) = 0.3$.

   (a) Write down $\mathrm{P}(A \cap B)$.

   (b) Find $\mathrm{P}(A' \cup B)$.

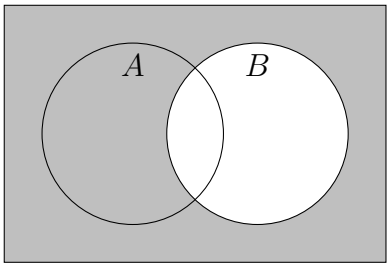
4. For each Venn diagram, write an expression representing the shaded area.

(a) For example, for this diagram



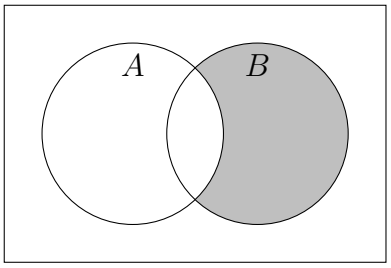
Expression: $A \cap B'$

(b)



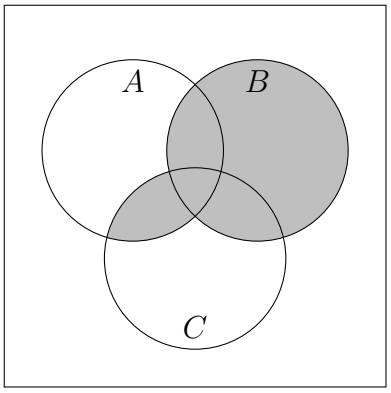
Expression:

(c)



Expression:

(d)



Expression:

5. Given:
   $U = \{\text{the letters in the alphabet}\}$
   $A = \{a, b, c, d, e, f, g, h, i, j\}$ $B = \{h, i, j, k, l, m, n, o, p, q\}$

   (a) What is $A \cap B$?

   (b) What is $(A \cup B)'$?