

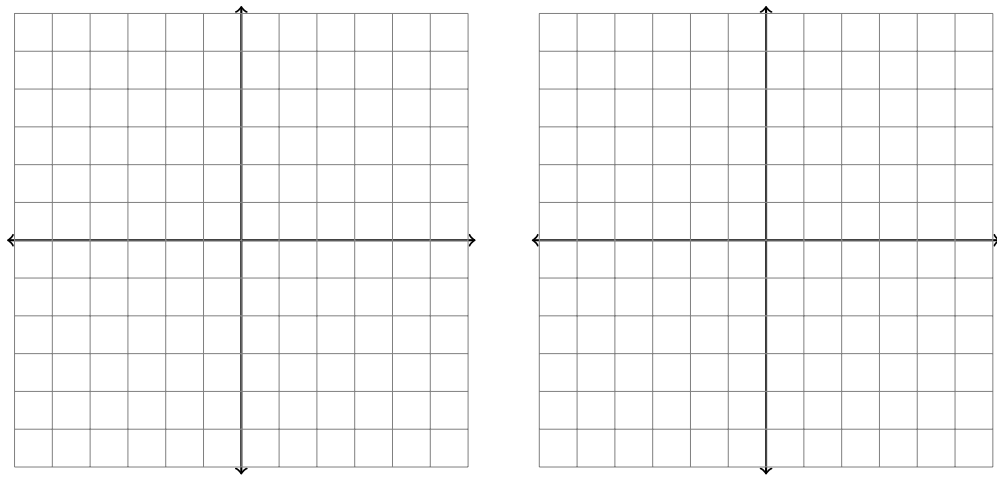
MATH 6: HOMEWORK 28. REVIEW!

1. (Knights and Knaves) On an island of knights (always tell the truth) and knaves (always lie), you meet A and B. Suppose A says, "I am a knave, but B isn't." What are A and B?
2. (Inclusion/Exclusion) In a class of 30 students, 14 take Biology, 12 take Chemistry, 10 take Physics, 5 take both Biology and Chemistry, 4 take both Biology and Physics, 3 take both Chemistry and Physics, and 2 take all three. How many students take no science?
3. (Sets in Words) Let A = students who play a sport, B = students who play a musical instrument, C = students who volunteer. Describe in words each set:
 - (a) $A \cap (B \cup C)$
 - (b) $(A^c \cap B) \cup C$
 - (c) $(A \cup B) \cap C^c$
 - (d) $(A \cap B) \cup (B \cap C)$
4. (Algebra) Solve for x in: $2x^2 - (x - 3)(2x + 1) + 5x - 12 = 0$.
5. (Absolute Value) Solve for x in: $|4x - 9| = 7$
6. (Counting) In how many distinct ways can the letters of the word ALGEBRA be arranged?

7. (Probability) From a standard 52-card deck, two cards are drawn at random without replacement. What is the probability that both cards are face cards (J, Q, or K)?

8. (Exponent Rules) Simplify completely: $\frac{(a^{-2}b^3)^2 a^5 b^{-1}}{a^3 b^4}$.

9. (Linear & Absolute Value Graphs) Sketch (by hand) the graphs of the following on the same coordinate axes and label intercepts clearly: (a) $3x - 2y = 6$ (b) $y = |x - 2| - 3$



10. (Coordinate Geometry) Point P has coordinates $(-2, 5)$. Find the coordinates of
(a) P' obtained by reflecting P across the y -axis.

(b) P'' obtained by rotating P by 90 degrees counterclockwise about the origin.

(c) P''' obtained by reflecting P across the line $y = x$.

11. (Linear system of Equations) Solve the system:

$$\begin{aligned} 2x + 3y &= 11, \\ x - 2y &= -1. \end{aligned}$$