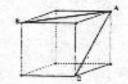Problems 25-26. Time limit 10 minutes.

25. (a classic)   Points A, B, and C are vertices of a cube as shown.
Find the degree-measure of $\angle BAC$.

26. If $\sin^6 x + \cos^6 x = \dfrac{2}{3}$, find all possible values of $\sin(2x)$

Problems 27-28 10 minutes.

27. In each game of the World Series between Team A and Team B, the probability that Team A wins is 0.6. The series ends when one team wins four games. Find the probability that Team A wins the World Series in exactly five games. Express your answer to four significant digits.

28. On a series of 10-point quizzes, Dan scored 8, 2, 5, 8, 3, x, and 7. Assuming the data has exactly one mode, and the arithmetic mean of the mean, median, and mode is 7, find x. (All scores must be integers)

Problems 29-30 11 minutes.

29. Solve for x : $\left|5 - x^2\right| > 2$ (Use exact values only. **Do not approximate**)

30. In the figure shown, the circles are tangent to both sides of $\angle BAC$ and the two outer circles are both tangent to the middle circle. If the circles have radii 6, 8, and r (r in the largest circle), find r.