Problems19-20. Time limit 10 minutes.

19. A line parallel to $2x+5y-8=0$ contains the points $(3,7)$ and $(a,3)$. Find a.

20. Ten slips of paper, numbered 1 through 10, are placed in a box. Three slips are drawn without replacement. Find the probability that the largest number drawn is a 6.

Problems 21-22. 10 minutes.

21. Evaluate: $(\log_{16}\sqrt{3})(\log_{27}\sqrt[3]{7})(\log_5 8)(\log_{49}25)$

22. The midpoints of the sides of regular hexagon ABCDEF are G, H, I, J, K, and L respectively. Find the ratio of the area of ABCDEF to the area of GHIJKL

Problems 23-24. 11 minutes.

23. If $0\le\theta\le\frac{\pi}{2}$ and $\sin\theta+\cos\theta=\frac{5}{4}$, find the value of $\tan\theta+\cot\theta$

24. In acute triangle ABC, E is on $\overline{AB}$ and D is on $\overline{AC}$ so that $\overline{CE}$ and $\overline{BD}$ are altitudes. Point N is the midpoint of $\overline{ED}$ and point M is the midpoint of $\overline{BC}$. If ED = 20 and BC = 30, find the length of $\overline{MN}$.