Problems19-20. Time limit 10 minutes.

19. Find a two-digit number whose value is twice the product of its digits.

20. Al, Bob, Carl, and Dave were accused of a crime. They each made a statement. Exactly three of the statements are true. Who is guilty? The statements are as follows. Al: If I'm guilty, then Carl lied.
Bob: Dave lied when he said I did it. Carl: If Al isn't guilty, then Bob is guilty. Dave: Bob did it.

Problems 21-22. 10 minutes.

21. Factor completely over the integers: $x^2(x-1)-3x^2-7x+10$

22. Points A(-6,0) and B(0,6) are marked All points P on the plane with AP + PB =20 are graphed to form an ellipse. Find the length of the minor axis of the ellipse.

Problems 23-24. 11 minutes.

23. A standard, fair six-sided die is rolled repeatedly until a "5" occurs. Find the probability that this will take four or fewer rolls.

24. [a classic] In the circle with center O, $\overline{AB}$ *and* $\overline{CD}$ are perpendicular diameters. $\overline{PQ} \parallel \overline{AB}$ and $\overline{QR} \parallel \overline{CD}$.
PR = 10 and PD = 2.

Find the diameter of the circle.