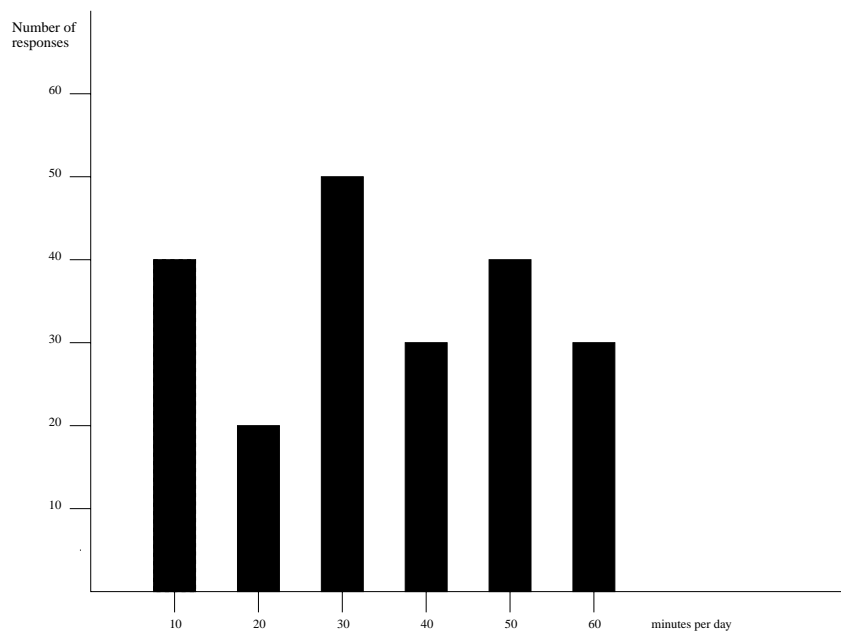
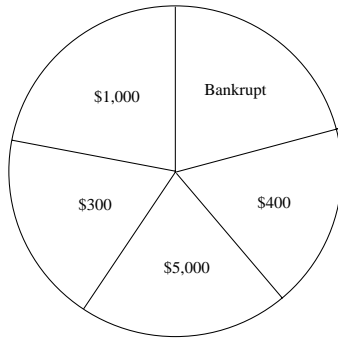


AB EXAM
TAMU High School Mathematics Contest
November 2001

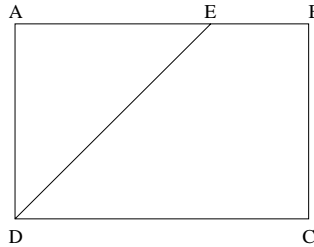
1. Find the remainder when $8 \cdot 10^{18} + 1^{18}$ is divided by 9 .
2. Find the area of the trapezoid bounded by the graphs of the equations $x = 6$, $y = 4$, $y = \frac{1}{2}x$ and the y -axis.
3. What two-digit number is three times the sum of its digits?
4. What is the sum of the prime factors of $2^{16} - 1$.
5. The arithmetic mean of eight numbers is 75 . If the mean of three of these numbers is 60 , find the mean of the remaining five numbers.
6. A worker gets a 25% increase in salary. If the new salary is \$18,750 , what was the old salary in dollars?
7. The results of a recent survey of subscribers to the local daily newspaper were summarized in the table below showing the number of people who responded and the number of minutes per day they devote to reading the newspaper. What fractional part of the people surveyed spend 20 to 40 minutes per day reading the paper?



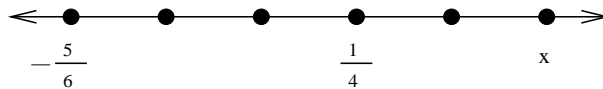
8. On the game show *Wheel of Fraction*, you see the following spinner. Given that each region has the same area, what is the probability that you will earn exactly \$1,700 in your first three spins? Express your answer as a common fraction.



9. $ABCD$ is a rectangle and $DE = DC$. Given $AD = 5$ and $BE = 3$, find DE .



10. Hasse wants to buy four donuts from a dealer with an ample supply of three types of donuts: glazed, chocolate and powdered. How many different selections are possible?
11. A palindrome is a number whose value is unchanged when its digits are reversed. How many palindromes are there which are greater than 10 and less than 800 ?
12. Jack spent one-half of his money for a movie ticket, two-thirds of the remainder for popcorn and the remaining \$2 for a drink. How many dollars did he spend for a movie ticket?
13. The dots below are equally spaced. What is the value of the common fraction x ?

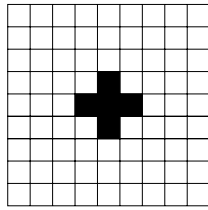


14. Given that $a \otimes b = (a^2 + b) \div 2$. What is the value of $5 \otimes 3$?
15. The number of square inches in the areas of rectangles A , B and C are shown in the diagram. How many square inches are in the area of rectangle D ?

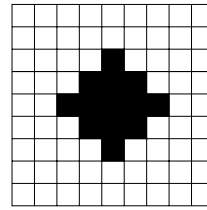
A 30	B 45
D	C 63

16. What is the greatest integer x for which $\frac{7}{9} > \frac{x}{13}$?

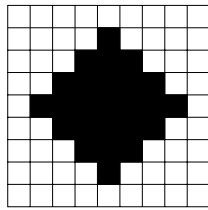
17. Consider the following sequence:



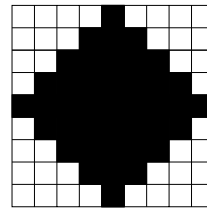
(a) Stage 1



(b) Stage 2



(c) Stage 3



(d) Stage 4

If this sequence continues, how many shaded squares will there be at stage 10 ?