

Name _____

Correct _____ x 5 = _____

School _____

Skipped _____ x 1 = _____

Division (circle one) Calc Alpha Theta Sponsor

Total _____

DO NOT TURN THIS SHEET OVER UNTIL TOLD TO BEGIN

- Do not turn this page until the proctor gives the signal to begin.
- This is an 8 minute test with 40 problems.
- ALL PROBLEMS MUST BE SOLVED MENTALLY.
- There is to be NO writing on the test other than the answer.
- Writing other than the answer(s) will result in disqualification of the test taker.
- The answer should be written in the space provided.
- No erasures may be made to an answer once written.
- Use a pen with blue or black ink.
- All problems require exact answers.
- Fraction answers may be given as improper fractions, mixed numbers, or exact decimals unless otherwise specified.
- You will receive 5 points for each correct answer.
- 1 point for each question skipped
- 0 points for each incorrect answer.
- Wait for the signal to begin then you will have 8 minutes of working time.
- A warning will be given at 1 minute and 15 seconds left in the testing time.



Mental Math FAMAT State 2008

- _____ 1) $2345 + 5432 =$
- _____ 2) $32^2 =$
- _____ 3) $123 \cdot 23 =$
- _____ 4) $68 \cdot 42 =$
- _____ 5) **LCM of 9,15,21**
- _____ 6) $41 \cdot 70 + 39 \cdot 70 =$
- _____ 7) **The next term of
1,5,12,22,35,...**
- _____ 8) **6 is what percent of 25?**
- _____ 9) **$346 \div 9$ has a remainder of**
- _____ 10) $2^2 - 3^2 + 4^2 - 5^2 =$
- _____ 11) $(3 - 2i)(3 + 2i) = a + bi; a =$
- _____ 12) **If $3x - 9 < 27$, then $x <$**
- _____ 13) **Evaluate:** $\frac{4! + 3! + 2!}{3! + 2!}$
- _____ 14) **The GCF of 56 and 98 is**
- _____ 15) $55^2 =$
- _____ 16) $2\frac{2}{3} + 3\frac{1}{2} =$ **(mixed number)**
- _____ 17) $14 \cdot 14 \frac{9}{14} =$
- _____ 18) $43 + 41 + 45 + 19 + 17 =$
- _____ 19) $\sqrt{27 \cdot 12}$
- _____ 20) **17% of 216 is what
percent of 72?**
- _____ 21) **If $A = 3, B = 4$ find the
value of $B^A - A^B$.**
- _____ 22) **Find the smallest positive
integer k such that
 $5k + 2$ is a perfect cube**

- _____ 23) $213_4 = \text{---}_{16}$
- _____ 24) Find the 10th term in the sequence 3, 7, 11, 15,...
- _____ 25) Solve for r: $(2 \cdot 5^r)^2 = 20$
- _____ 26) Let P_n denote the nth pentagonal number.
Find the value of $P_2 + P_3$
- _____ 27) If $4^{x+3} = 8^x$, $x =$
- _____ 28) If $9^{x+2} = 27$, $x =$ (fraction)
- _____ 29) The sides of a right triangle are integers. If one leg is 9, then the hypotenuse is
- _____ 30) A convex dodecagon has n diagonals, $n =$
- _____ 31) If the volume of a right cone is 9π , $h = r$, $r =$
- _____ 32) A regular dodecagon's exterior angles each measure (degrees)
- _____ 33) $83 \cdot 99 =$
- _____ 34) Find the length of the major axis of the ellipse:
 $3x^2 + 9y^2 = 27$
- _____ 35) The ratio of the area of a circle to its circumference whose area is 16π is ?
- _____ 36) If $\log_a 4 = 7$, then $\log_a 16 =$
- _____ 37) $(5,6)$ is the midpoint of $(4,2)$ and (x,y) . $x + y =$
- _____ 38) Solve for x : $8(x+3)^2 = 72$
- _____ 39) The number 72 has how many prime divisors?
- _____ 40) Express as a simplified Fraction: $(0.\overline{09})(0.\overline{7})$

