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DIVISION: THETA

TEST: Sequences and Series 96

<p>1. $\frac{1996(2 + 3992)}{2} =$ C 3986012</p>	<p>7. $\sum_{k=1}^{100} 5 = 5 \cdot 100 = 500$ C</p>
<p>2. $\frac{1996(1 + 1996)}{2} =$ D 1993006</p>	<p>8. $900 = \frac{7(101 + a_7)}{2}$ C $\frac{1800 - 707}{7} = a_7$ $156.14 = a_7$</p>
<p>3. $F_{12} = 144$ B $F_{13} = 233 \text{ (PRIME)}$ $F_{16} = 987$</p>	<p>9. $4 \cdot 6 = 24$ B $1996^n \text{ ends in } 6$ $\forall n$</p>
<p>4. B EVERY 3RD IS EVEN $\therefore 16 \text{ EVEN} +$ 34 ODD $\text{Prob odd} = \frac{34}{50} = \frac{17}{25}$</p>	<p>10. $\frac{4 + 7 + 10 + \dots + 25}{-(3 + 6 + 9 + \dots + 24)}$ D $8 + 1 = 9$</p>
<p>5. B $a_{50} = 7 + 49(-2.5)$ $a_{50} = -115.5$</p>	<p>11. $\frac{\sqrt[3]{2}}{\sqrt{2}} = \frac{a_4}{\sqrt{2}}$ A $\frac{2^{1/3} \cdot 2^{1/6}}{2^{1/2}} = 1$</p>
<p>6. D $GM = \sqrt{499 \cdot 1996}$ $= 998$</p>	<p>12. $\frac{12}{1 - \frac{1}{2}} = 24$ A</p>

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<p>13. C</p> $i + i^2 + i^3 + i^4 = 0$ <p>So it goes.</p> $i + \dots + i^{1996} = 0$	<p>19. D</p> $a_1 = 19 ; a_2 = 96$ $a_{27} = 19 \cdot 26 (77)$ $= 2021$
<p>14. C</p> $ r < 1$	<p>20. B.</p> $\frac{1}{0!} - \frac{1}{1!} + \frac{1}{2!} - \frac{1}{3!} + \frac{1}{4!} =$ 0.375
<p>15. E</p> $S = \frac{\frac{2}{3}}{1 - \frac{2}{3}}$ $S = 2$	<p>21. E</p> $0.\overline{27} = \frac{27}{99}$ $= \frac{3}{11}$ $3 + 11 = 14$
<p>16. C</p> $\binom{10}{0} + \binom{10}{1} + \dots + \binom{10}{10} =$ 2^{10}	<p>22. A.</p> <p>CALCULATOR TESTED</p> $-1 + 5 + 9 = 15$
<p>17. C</p> <p>1:35 1:47 1:59 2:10 2:22</p>	<p>23. A</p> <p>4, 8, 12, ...</p> $a_{100} = 4 + 99(4)$ $a_{100} = 400$
<p>18. C</p> $a_9 = \frac{10^9}{9!} = 2755.73$ $a_{10} = \frac{10^{10}}{10!} = 2755.73$ $a_{11} = \frac{10^{11}}{11!} = 2505.21$	<p>24. B</p> $\frac{4^2(1 + 2^2 + 3^2 + \dots + 49^2)}{1 + 2^2 + 3^2 + \dots + 49^2}$ $= 16$

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<p>25. $\log_2 1 + \log_2 2 + \log_2 3 + \dots + \log_2 m$</p> <p>B $= \log_2 (1 \cdot 2 \cdot 3 \dots m)$</p> <p>$= \log_2 m!$</p>	<p>AM $\frac{a+b}{2} > \frac{HM}{\frac{2ab}{a+b}}$</p> <p>$(a+b)^2 > 4ab$</p> <p><u>TRUE</u></p>
<p>26. $S = \left(\frac{1996(1+1996)}{2} \right)^2$</p> <p>D $S = 3.97... \times 10^{12}$</p> <p>$\therefore$ 13 DIGITS</p>	<p>29. $1+1+1+$ $2+2+2+2+2+$ $3+3+3+3+3+3+$ $4+4+4$</p> <p>$\therefore 3+10+21+12 = 46$</p>
<p>27. $\frac{2+4+6+\dots+2m}{-(1+3+5+\dots+(2m-1))}$</p> <p>A $\frac{1+1+1+\dots+1}{m}$</p>	<p>30. $2 \left(\frac{78}{1-\frac{3}{4}} \right) - 78$</p> <p>$2 \cdot 4 \cdot 78 - 78 =$ $7 \cdot 78 = 546$</p>
<p>28. AM $\frac{a+b}{2} > \sqrt{ab}$</p> <p>B $(a+b)^2 > 4ab$</p> <p>$a^2 - 2ab + b^2 > 0$ TRUE</p> <hr/> <p>HM $\frac{2ab}{a+b} > \sqrt{ab}$</p> <p>$2ab > a+b$</p> <p>$4ab > a^2 + 2ab + b^2$</p> <p>$0 > a^2 - 2ab + b^2$</p> <p>FALSE</p>	