## 2005 Hoover High School Mathematics Tournament $7^{\text {th }}$ Grade Written Examination

1. A triangle has angles in the ratio 2:3:4. What is the measure of the smallest angle in the triangle?
a) 20
b) 40
c) 10
d) 9
2. Evaluate:

$$
.1+\frac{.2}{.3+\frac{.4}{.5+.6}}
$$

a) $\frac{33}{7}$
b) $\frac{10}{11}$
c) $\frac{73}{110}$
d) $\frac{293}{730}$
3. $4201_{5}+3123_{4}=?{ }_{10}$
a) 770
b) 7324
c) 814
d) 1621
e)NOTA
4. What are the odds of rolling 3 even numbers with 3 fair die?
a) $\frac{1}{8}$
b) $\frac{7}{8}$
c) $\frac{1}{7}$
d) $\frac{6}{7}$
e) NOTA
5. $10 \%$ of the students in Mrs. Entrekin's class fail the math exam. If 45 students pass the exam, how many students are in the class?
a) 55
b) 120
c) 50
d) 49
e) NOTA
6. Bob earned $\$ 2$ after his first week at the carwash. He earned twice as much the $2^{\text {nd }}$ week. The third week he earned twice as much as he did in the second week. If the pattern of earnings continue, what is Bob's average weekly earnings after six weeks?
a) $\$ 64$
b) $\$ 11$
c) $\$ 21$
d) $\$ 66$
7. Evaluate: $4 . \overline{29}+3 . \overline{3}-6 . \overline{7}=$ ?
a) $\frac{89}{99}$
b) $\frac{28}{33}$
c) $\frac{89}{100}$
d) $\frac{29}{99}$
8. Find the sum of the units digits of $407^{92}$ and $14^{12}$.
a) 11
b) 15
c) 5
d) 7
9. A farmer has 20 animals. He only has ducks and dogs. If there are 46 total legs, how many ducks are their?
a) 14
b) 6
c) 17
d) 3
e) NOTA
10. Find the length of the longest fishing rod that will fit inside a box that is 3 feet long, 2 feet wide, and 4 feet tall.
a) $\sqrt{29} \mathrm{ft}$.
b) $2 \sqrt{6} \mathrm{ft}$.
c) $5 \sqrt{2} \mathrm{ft}$.
d) 5 ft .
e) NOTA
11. Find the ratio of the area of the triangle to the area of the rectangle:

a) $\frac{2 x}{y+z}$
b) $\quad \frac{x}{y z}$
c) $\frac{x y z}{2}$
d) $\frac{z}{2(y+z)}$
e)NOTA
12. Paul leaves his house and walks to school using the following route. He goes north 14 miles then east 6 miles then south 6 miles. He is able to leave school and head in a straight line home. What was Paul's total round trip walking distance?
a) 26 miles
b) 36 miles
c) 42 miles
d) 50 miles
e) NOTA
13. What is the measure of the acute angle made by the minute and hour hand at $3: 30 \mathrm{pm}$ ?
a) $15^{0}$
b) $90^{\circ}$
c) $60^{\circ}$
d) $75^{0}$
e)NOTA
14. If $a \# b=2 a b-a^{2}$, find $2 y \#(y \# 3 y)$
a) $20 y^{3}-4 y^{2}$
b) $16 y$
c) $16 y-10$
d) $5 y^{3}-4 y^{2}$
15. Solve for $x: \quad\left(3^{x}\right)(27)(81)=3^{21}$
a) 14
b) 12
c) 10
d) 1
16. Find the area of a square that has a diagonal with length 16 units.
a) 256 units $^{2}$
b) 18 units $^{2}$
c) 64 units $^{2}$
d) 128 units $^{2}$
e) NOTA
17. In 33 years Jennifer will be $21 / 2$ times as old as she is now. How old will she be in 10 years?
a) 32
b) 43
c) 12
d) 99
e)NOTA
18. The square root of the cube root of a number is .25 . What is the number?
a) .125
b) $\frac{1}{4096}$
c) .0025
d) $\frac{1}{125}$
e)NOTA
19. The gauge on a gas tank reads $3 / 4$ full. When you put 6 more gallons into the tank, the gauge reads $5 / 6$ full. How many total gallons does the tank hold?
a) 36
b) 24
c) 72
d) 80
e) NOTA
20. Paul's wife is going shopping. She spends one third of her money on clothes. She then spends two thirds of the money she has left on food. Finally she spends the remaining $\$ 28$ on CDs. How much money did Paul's wife have at the start?
a) $\$ 126$
b) $\$ 84$
c) $\$ 63$
d) $\$ 42$
e)NOTA
21. What is the probability of hitting the shaded bullseye on the dart board? (Assume the dart must hit the board)
a) $\frac{\pi}{4}$
b) $\frac{1}{9}$
c) $\frac{1}{3}$
d) $\frac{4}{9}$
e)NOTA

22. Jill can finish a project in 2 hrs . Alex can finish the same project in 3 hrs . Working together, how long would it take the two of them to finish one project?
a) 1 hr .12 min .
b) 2 hrs .30 min .
c) 5 hrs .
d) 1 hr .50 min .
e) NOTA
23. A triangle has vertices $\mathrm{A}(2,3), \mathrm{B}(6,9), \mathrm{C}(1,12)$. If the triangle is reflected over the x -axis, how far from the point ( 1,1 ) is the new point $\mathrm{C}^{\prime}$ ?
a) 12 units
b) 13 units
c) $2 \sqrt{3}$ units
d) $\sqrt{13}$ units
24. Using $F(x)=(3 x)^{2}$ and $G(x)=x^{2}-4$. Find the value of: $G(a)+F(2 a)$
a) $16 a^{2}-16$
b) $9 a^{2}-4$
c) $37 \mathrm{a}^{2}-4$
d) $4 a^{2}+16$
e) NOTA
25. Find the surface area of a cube that has a volume of $\sqrt{8}$ units ${ }^{3}$.
a) 6 units $^{2}$
b) $6 \sqrt{8}$ units $^{2}$
c) 8 units $^{2}$
d) 12 units $^{2}$

Tie Breakers:
TB1 Find a positive number that is $11 / 2$ more than its reciprocal.
TB2 What is the diameter of a 4 unit tall cylinder that has a volume of $25 \pi$ units $^{2}$ ?
TB3 Find the value of the third root of 64 ?

