ADVANCED MATH TEST 1

Name_____ Date_____

Directions: You have 30 minutes. No calculators! Some questions may require more than one answer.

1. $\frac{3}{4a^4b^6}-\frac{2}{6a^5b^3}-1=$

(A) $\frac{9a-4b^3-6a^5b^2}{12a^5b^6}$ **(B)** $\frac{9a-4b^3-1}{12a^5b^6}$ **(C)** $\frac{18a-8b^3-1}{24a^5b^6}$ **(D)** $\frac{9a-4b^3-12a^5b^6}{12a^5b^6}$ **(E)** $\frac{9a^5b^3-4a^4b^6-1}{12a^9b^9}$

2. $\sqrt{1\frac{13}{36}}-\frac{1}{3}=$ **(A)** $\frac{5}{6}$ **(B)** $\frac{7}{9}$ **(C)** $\frac{8}{9}$ **(D)** $\frac{29}{36}$ **(E)** $\frac{31}{36}$

3. A trapezoid has a height of $6\sqrt{3}$ and the bases are $4\sqrt{3}$ and $2\sqrt{6}$. Find the area.

(A) $72-36\sqrt{2}$ **(B)** $72+36\sqrt{2}$ **(C)** $36-18\sqrt{2}$ **(D)** $36+18\sqrt{2}$ **(E)** $36+18\sqrt{6}$

4. Evaluate $4\left(x-\frac{\sqrt{y}}{2}\right)\left(x+\frac{\sqrt{y}}{2}\right)+y-5x^2$ if $x=-\sqrt{5}$ and $y=-2$

(A) -5 **(B)** -2 **(C)** 1 **(D)** 2 **(E)** 5

5. If you double a number and subtract 3, you get *q*. If you double *q* and subtract 3, you get *p*. If you double *p* and subtract 3, you get -9. Find the original number you started with.

(A) -4 **(B)** -3 **(C)** -2 **(D)** -1 **(E)** 1.5

6. Twice the sum of $(x-y)$ and -6 is 18 less than the opposite of $(x-y)$. Find the value of $(x-y+1)^5$.

(A) -5 **(B)** -1 **(C)** 5 **(D)** 10 **(E)** 32

7. A rectangle with a width of $(4x-2)$ and a length of $(2x+4)$ has an area how much greater than a rectangle one-fourth its size?

(A) $6x^2-9x-10$ **(B)** $6x^2-9x+6$ **(C)** $6x^2+9x-6$ **(D)** $6x^2-8x-6$ **(E)** $6x^2-8x+6$

8. Evaluate $\frac{2(x+3y)(x^2-3xy+9y^2)+2(x-3y)(x^2+3xy+9y^2)}{x^2}$ if $x=2\frac{3}{4}$ and $y=-1$.

(A) -1 **(B)** $2\frac{3}{4}$ **(C)** $5\frac{1}{2}$ **(D)** $8\frac{1}{4}$ **(E)** 11

9. The complement of an angle is 198° less than twice its supplement. Find the angle.

(A) 72° **(B)** 73° **(C)** 74° **(D)** 75° **(E)** 76°

10. $\frac{50(a+b)}{c}$ quarters is equivalent to how many dimes if $a=10-b$?

(A) $\frac{200}{c}$ **(B)** $\frac{250}{c}$ **(C)** $\frac{750}{c}$ **(D)** $\frac{1000}{c}$ **(E)** $\frac{1250}{c}$

11. If $3\frac{1}{2}\left[\frac{(x+2)(x-4)}{6}\right]=5$, then $-2\frac{4}{5}\left[\frac{(x+2)(x-4)}{6}\right]=$

(A) -4 **(B)** -3 **(C)** -2 **(D)** 2 **(E)** 3

12. If you are traveling $6xy-9y+12x-18$ miles at a rate of $2x-3$ miles per hour for 30 hours, find the value of *y*.

(A) 5 **(B)** 6 **(C)** 7 **(D)** 8 **(E)** 9

13. If $3\left[(ax+bx)\left(\frac{8}{2a+2b}\right)\right]^3-24=0$, solve for x^2. Assume $a\neq -b$.

(A) $\frac{1}{4}$ **(B)** $\frac{1}{2}$ **(C)** $\frac{2}{3}$ **(D)** 1 **(E)** $2^{\frac{2}{3}}$

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14. Simplify $-5\left(\frac{x-y}{y-x}\right)^{a-b}+3\left(\frac{y-x}{x-y}\right)^{a-b+3}-2\left(\frac{x-y}{y-x}\right)^{a-b+2}$. Assume $y \neq x$ and $a-b$ is an odd integer.

(A) -10 **(B)** -6 **(C)** -4 **(D)** 0 **(E)** 10

15. If $\frac{\left[\left(x+y+z\right)^{w}\right]^{w}}{\left(x+y+z\right)^{w}}=\left(x+y+z\right)^{30}$, what is the smallest possible value for *w*. Assume $x+y+z>1$.

(A) -10 **(B)** -6 **(C)** -5 **(D)** -3 **(E)** 3

16. The ratio of two numbers *x*:*y* is *w*:*v*. Find the value of $\left(\frac{xv}{yw}-2\right)^{4}$.

(A) 0 **(B)** 1 **(C)** 16 **(D)** 81 **(E)** 256

17. Solve the following for *x*. $\begin{cases} a^2+b^2-c^2=-4 \\ a^2-b^2+c^2=12 \\ x=a^2 \end{cases}$

(A) 4 **(B)** 5 **(C)** 6 **(D)** 7 **(E)** 8

18. For $6x-5y+4=0$, how much larger is the *y*-intercept than the *x*-intercept?

(A) $\frac{2}{15}$ **(B)** $\frac{8}{15}$ **(C)** $\frac{14}{15}$ **(D)** $\frac{16}{15}$ **(E)** $\frac{22}{15}$

19. If $\frac{\left(a+b\right)^{8}}{c^{3}}=c^{3}$, then $\left(a+b\right)^{28}=$

(A) c^{18} **(B)** c^{21} **(C)** c^{27} **(D)** c^{31} **(E)** $c^{31.5}$

20. If $\frac{27a^3-64b^9}{9a^2+12ab^3+16b^6}=-24$ and $4b^3=-6$, then *a* =

(A) -10 **(B)** -6 **(C)** 6 **(D)** -4 **(E)** 4

21. Find the value of $(-2)^{2\sqrt[3]{x}+3\sqrt[5]{y}-6\sqrt[4]{z}}$ if $2\sqrt[3]{x}+3\sqrt[5]{y}-3=6\sqrt[4]{z}-3$

(A) -2 **(B)** -1 **(C)** 0 **(D)** 1 **(E)** 2

22. If $d\left(e-f\right)+16-\frac{4}{a+b+c}=8+de-df$, find the value of $\left(a+b+c+0.5\right)^{3}$

(A) $-\frac{27}{8}$ **(B)** $\frac{27}{8}$ **(C)** $\frac{125}{8}$ **(D)** 1 **(E)** 8

23. $x^{\frac{1}{7}\sqrt{y}}\left[x^{\frac{1}{7}\sqrt{y}}+\frac{x^{\frac{1}{7}\sqrt{y}}+x^{\frac{1}{7}\sqrt{y}}}{2}-x^{\frac{1}{7}\sqrt{y}}\right]=$

(A) $x^{\frac{2}{7}\sqrt{y}}$ **(B)** $x^{\frac{1}{49}\sqrt{y}}$ **(C)** $x^{\frac{2}{49}\sqrt{y}}$ **(D)** $x^{\frac{2}{7}y}$ **(E)** $x^{\frac{1}{7}\sqrt{y}}$

24. Evaluate $\frac{\left(x^3-4x\right)\left(x^2-4x-12\right)}{\left(x^2-4\right)\left(x^2-8x+12\right)\left(x^2+4x+4\right)}$ if $x^2=5$. Assume $x \neq -\sqrt{5}$.

(A) 1 **(B)** 2.5 **(C)** $\sqrt{5}$ **(D)** 5 **(E)** 25

25. If $3=\frac{n_1v_2}{n_2v_1^{\,2}}$, then $n_1v_2n_2v_1=$

(A) $3n_2^{\,2}v_1^{\,3}$ **(B)** $3n_2v_1^{\,2}$ **(C)** $3n_2v_1^{\,3}$ **(D)** $3n_2v_1$ **(E)** $3n_2^{\,2}v_1^{\,2}$

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ADVANCED MATH TEST 1 ANSWERS

1. D	2. A	3. D	4. A	5. E
6. B	7. C	8. E	9. A	10. E
11. A	12. D	13. A	14. E	15. C
16. B	17. A	18. E	19. B	20. A
21. D	22. D	23. A	24. C	25. A

1. $\dfrac{9a-4b^3-12a^5b^6}{12a^5b^6}$
2. $\dfrac{7}{6}-\dfrac{2}{6}=\dfrac{5}{6}$
3. $3\sqrt{3}\left(4\sqrt{3}+2\sqrt{6}\right)=36+18\sqrt{2}$
4. $-x^2=-5$
5. $8x-21=-9\rightarrow x=1.5$
6. $x-y=-2\rightarrow\left(x-y+1\right)^5=-1$
7. $\dfrac{3}{4}\left(8x^2+12x-8\right)=6x^2+9x-6$
8. $2\dfrac{3}{4}\cdot 4=11$
9. $90-x=360-2x-198\rightarrow x=72$
10. $\dfrac{250}{c}\cdot 5=\dfrac{1250}{c}$
11. $-\dfrac{14}{5}\cdot\dfrac{10}{7}=-4$
12. $\dfrac{6xy-9y+12x-18}{2x-3}=3y+6\rightarrow y=8$
13. $3\left(4x\right)^3=24\rightarrow x=\dfrac{1}{2}\rightarrow x^2=\dfrac{1}{4}$
14. $5+3+2=10$
15. $\left(w-6\right)\left(w+5\right)=0\rightarrow w=-5$
16. $\dfrac{x}{y}=\dfrac{w}{v}\rightarrow xv=yw\rightarrow\dfrac{xv}{yw}=1\rightarrow\left(1-2\right)^4=1$
17. $2a^2=8\rightarrow a^2=4$
18. $\dfrac{4}{5}+\dfrac{2}{3}=\dfrac{22}{15}$
19. $\left[\left(a+b\right)^8\right]^{3.5}=\left(c^6\right)^{3.5}=c^{21}$
20. $3a-4b^3=-24\rightarrow a=-10$
21. $\left(-2\right)^0=1$
22. $a+b+c=\dfrac{1}{2}\rightarrow\left(a+b+c+0.5\right)^3=1$
23. $x^{\frac{2}{7}\sqrt{y}}$
24. $\dfrac{x}{x^2-y}=x=\sqrt{5}$
25. $n_1v_2=3n_2v_1\rightarrow n_1v_2n_2v_1=3{n_2}^2{v_1}^3$