ADVANCED MATH TEST 2

Name_____ Date_____

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

1. Simplify $\left[6x^2-\dfrac{12x^4-28x^3+20x^2}{3x^2-7x+5}\right]^3$

(**A**) 6 (**B**) $6x^6$ (**C**) $6x^8$ (**D**) $8x^6$ (**E**) $8x^8$

2. If you change the diameter of a sphere so that the diameter is tripled, by how many times larger will the volume be?

(**A**) 3 times (**B**) 9 times (**C**) 16 times (**D**) 27 times (**E**) 216 times

3. The area of a trapezoid is 120 square feet and its height is 20 feet. The bases are b_1 and b_2. How much greater is $14\dfrac{1}{2}-b_2$ than b_1?

(**A**) 2.5 (**B**) 4.5 (**C**) 9.5 (**D**) 11.5 (**E**) 14.5

4. If $\dfrac{\dfrac{x_1x_2}{x_3x_4}}{\dfrac{x_5x_6}{x_7x_8}}=1$, find the value of x_3.

(**A**) $\dfrac{x_4x_5x_6}{x_1x_2x_7x_8}$ (**B**) $\dfrac{x_1x_2x_7x_8}{x_4x_5x_6}$ (**C**) $\dfrac{x_4x_7x_8}{x_1x_2x_5x_6}$ (**D**) $\dfrac{x_1x_2x_5x_6}{x_4x_7x_8}$ (**E**) $\dfrac{x_1x_2x_4x_8}{x_5x_6x_7}$

5. If a line has a slope of $-\dfrac{2}{3}$ and contains the point $(-12,-4)$, find the *x*-coordinate of the ordered pair when $y=-18$.

(**A**) -6 (**B**) -3 (**C**) 3 (**D**) 6 (**E**) 9

6. Solve the following for $\dfrac{x}{y}$. $-3\left(\dfrac{x}{y}+2\right)=-2\cdot\dfrac{x}{y}+6$

(**A**) -12 (**B**) -4 (**C**) 0 (**D**) 4 (**E**) 12

7. If $-16-4\left(x^3+y^3\right)=-48$, find $\dfrac{\left(x^3+y^3\right)^2}{4}$.

(**A**) 1 (**B**) 9 (**C**) 16 (**D**) 64 (**E**) $\dfrac{25}{4}$

8. For $6y+4x-6=0$ and $-12x+8y=-8$, what is the reciprocal of the product of the two slopes?

(**A**) -2 (**B**) -1 (**C**) $\dfrac{1}{2}$ (**D**) 1 (**E**) 2

9. If $x^2+y^3-w^5+z^4-7=9$, find the value of $\sqrt[3]{x^2+y^3-w^5+z^4+11}-7$.

(**A**) -7 (**B**) -6 (**C**) -4 (**D**) 1 (**E**) 2

10. If $w=\left(x^y\right)^z$, $y=3\sqrt[3]{a}$, and $z=3$, which of the following is equivalent to *w*?

(**A**) x^{9a} (**B**) x^{27a} (**C**) $x^{6\sqrt[3]{a}}$ (**D**) $x^{9\sqrt[3]{a}}$ (**E**) $x^{27\sqrt[3]{a}}$

11. Which point is not a member of the solution set? $\begin{cases}-6x+7y<42\\5y+2x\geq-10\end{cases}$

(**A**) $(-5,0)$ (**B**) $(-4,2)$ (**C**) $(-1,5)$ (**D**) $(3,-4)$ (**E**) $(1,-2)$

12. Simplify $\dfrac{4x+2}{a-b}+\dfrac{3x-1}{b-a}-\dfrac{7x+4}{a-b}$

(**A**) $\dfrac{-6x-3}{a-b}$ (**B**) $\dfrac{-6x-1}{a-b}$ (**C**) $\dfrac{-6x+1}{a-b}$ (**D**) $\dfrac{-6x+3}{a-b}$ (**E**) $\dfrac{-6x+7}{a-b}$

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13. What is the ratio of the area of a circle to its circumference?

(A) $\frac{r}{2}$ **(B)** $\frac{2}{r}$ **(C)** $\frac{r}{\pi}$ **(D)** $\frac{2\pi}{r}$ **(E)** $\frac{r}{2\pi}$

14. The area of a trapezoid is 108 square inches and one of its bases has a length of 8 inches. If the height of the trapezoid is 1.5 feet, find the length of the other base in inches.

(A) 2 **(B)** 4 **(C)** 6 **(D)** 7 **(E)** 8

15. If the diameter of a cylinder is doubled and its height is tripled, how many times larger will the volume become?

(A) 6 **(B)** 12 **(C)** 16 **(D)** 18 **(E)** 48

16. The largest of three consecutive multiples of seven is $\frac{x+11}{6}$. What is the smallest of the three numbers?

(A) $\frac{x-157}{6}$ **(B)** $\frac{x-73}{6}$ **(C)** $\frac{x-31}{6}$ **(D)** $\frac{x-1}{6}$ **(E)** $\frac{x+5}{6}$

17. When solving $-3x^2-7x-3=0$, what is the sum of the two roots?

(A) $-\frac{7}{3}$ **(B)** $\frac{7\pm\sqrt{13}}{-6}$ **(C)** 0 **(D)** $\frac{-7-2\sqrt{13}}{6}$ **(E)** $\frac{-7+2\sqrt{13}}{6}$

18. If the midpoint of $(-10,4)$ and $(-e,f+2)$ is $(2,-8)$, find the value of $2(e-f)$.

(A) -8 **(B)** 8 **(C)** 12 **(D)** 16 **(E)** 72

19. Find the value of *y* if $x-2\left(\frac{\sqrt[4]{v}-\sqrt[3]{z}}{\sqrt[5]{w}}\right)^0=-\left(\frac{\sqrt[6]{q}-\sqrt[7]{p}}{\sqrt[8]{r}}\right)^0$ and $y^2x^8+4yx^6-32x^{12}=0$. Assume $y\neq -8$.

(A) -1 **(B)** 0 **(C)** 1 **(D)** 2 **(E)** 4

20. If $y=-2x^2+x+1$, find the value of $y-\frac{9}{8}$.

(A) $-2\left(x-\frac{1}{2}\right)^2$ **(B)** $-2\left(x-\frac{1}{4}\right)^2$ **(C)** $-2\left(x+\frac{1}{4}\right)^2$ **(D)** $-2\left(x+\frac{1}{2}\right)^2$ **(E)** $-2\left(x+\frac{1}{10}\right)^2$

21. Which of the following equations would not be dependent with $2x-3y=-1$ in a system of equations?

(A) $14x=21y-7$ **(B)** $8-16x=-24y$ **(C)** $-6=12x-18y$ **(D)** $-12y=-8x-4$ **(E)** $18x+9=27y$

22. If the distance between (a,b) and (c,d) is e, find *b*.

(A) $d\pm\sqrt{e^2-(a-c)^2}$ **(B)** $-d\pm\sqrt{(a+c)^2-e^2}$ **(C)** $d\pm\sqrt{(a-c)^2-e^2}$ **(D)** $-d\pm(a+c-e)$ **(E)** $-d\pm(a-c-e)$

23. The line that goes through $\left(-\frac{2}{3},4\frac{1}{4}\right)$ and $\left(q,-8\frac{3}{4}\right)$ has a slope of 2. Find *q*.

(A) $-7\frac{1}{6}$ **(B)** $-7\frac{1}{2}$ **(C)** $-7\frac{1}{3}$ **(D)** $-7\frac{5}{6}$ **(E)** $-7\frac{2}{3}$

24. When $-2x^4-4x^3+3x-1$ is divided by $x-1$, what is the remainder?

(A) -6 **(B)** -5 **(C)** -4 **(D)** -3 **(E)** -2

25. Solving the following system for *e* by substitution yields which equation in the process? $\begin{cases}3e-5f=15\\2e+3f=7\end{cases}$

(A) $3e-5\left(-\frac{2}{3}e+\frac{7}{3}\right)=15$ **(B)** $3e-5\left(-\frac{2}{3}e-\frac{7}{3}\right)=15$ **(C)** $3e-5\left(\frac{2}{3}e-\frac{7}{3}\right)=15$

(D) $3e-5\left(\frac{2}{3}e+\frac{7}{3}\right)=15$ **(E)** $3e+5\left(\frac{2}{3}e+\frac{7}{3}\right)=15$

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ADVANCED MATH TEST 2 ANSWERS

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

1. $\left(6x^2-4x^2\right)^3=8x^6$
2. $v=\frac{4}{3}\pi\left(3r\right)^3=27\left(\frac{4}{3}\pi r^3\right)$
3. $120=\frac{1}{2}\cdot 20\left(b_1+b_2\right)\rightarrow 12=b_1+b_2\rightarrow 14\frac{1}{2}-12=2\frac{1}{2}$
4. $\frac{x_1x_2}{x_3x_4}=\frac{x_5x_6}{x_7x_8}\rightarrow x_3=\frac{x_7x_8x_1x_2}{x_5x_6x_4}$
5. $-18=-\frac{2}{3}x-12\rightarrow x=9$
6. $-3a-6=-2a+6\rightarrow a=-12$
7. $\frac{\left(x^3+y^3\right)^2}{4}=16$
8. $-\frac{2}{3}\cdot\frac{3}{2}=-1$
9. $\sqrt[3]{27}-7=-4$
10. $w=\left(x^{3\sqrt[3]{a}}\right)^3=x^{9\sqrt[3]{a}}$
11. $\left(3,-4\right)$
12. $\frac{4x+2-3x+1-7x-4}{a-b}=\frac{-6x-1}{a-b}$
13. $\frac{r}{2}$
14. $108=\frac{1}{2}\cdot 18\left(b+8\right)\rightarrow b=4$
15. $v=\pi\left(2r\right)^2\cdot 3h=12\pi r^2h$
16. $\frac{x-73}{6}$
17. $\frac{-7+\sqrt{13}}{6}+\frac{-7-\sqrt{13}}{6}=-\frac{7}{3}$
18. $2\left(-14+22\right)=16$
19. $y^2+4y-32=0\rightarrow y=4$
20. $y=-2\left(x-\frac{1}{4}\right)^2+\frac{9}{8}\rightarrow y-\frac{9}{8}=-2\left(x-\frac{1}{4}\right)^2$
21. $8-16x=-24y\rightarrow 2x-3y=1$
22. $\left(b-d\right)^2=e^2-\left(a-c\right)^2\rightarrow b=d\pm\sqrt{e^2-\left(a-c\right)^2}$
23. $-7\frac{1}{6}$
24. -4
25. $3e-5\left(-\frac{2}{3}e+\frac{7}{3}\right)=15$