ALGEBRA 2 TEST 3

Name_____ Date_____

Directions: Complete as many problems as you can in the 30 minutes allotted to you. No calculators!

1. In a Cartesian coordinate system, in what quadrant does $(-2,3)$ exist?

   (A) I **(B)** II **(C)** III **(D)** IV **(E)** V

2. $\frac{4}{xyz}+\frac{3}{zyx}=$

   (A) $\frac{7}{xyz}$ **(B)** $\frac{7}{2xyz}$ **(C)** $\frac{7}{x^2y^2z^2}$ **(D)** $\frac{7}{2x^2y^2z^2}$ **(E)** $\frac{12}{2xyz}$

3. If $x+1$ is an even integer, which is the next consecutive even integer?

   (A) x **(B)** $x+2$ **(C)** $x+3$ **(D)** $x+4$ **(E)** $x+5$

4. $\sqrt{m}+\sqrt{m}=$

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

5. If $a+b<c$, $c<d$, and $e<0$, which of the following must be false?

   (A) $e(a+b)>ce$ **(B)** $ec>ed$ **(C)** $e(a+b)>ed$ **(D)** $a+b+6<d+6$ **(E)** $\frac{a+b}{3}>\frac{d}{3}$

6. Which term is equivalent to $\frac{a^5}{b^{-3}c^5}$?

   (A) $\frac{1}{b^{-3}c^5a^5}$ **(B)** $a^5b^3c^5$ **(C)** $\frac{b^3c^{-5}}{a^{-5}}$ **(D)** $\frac{b^{-3}a^5}{c^5}$ **(E)** $\frac{c^{-5}}{b^{-3}a^5}$

7. Which number is the largest?

   (A) $2\sqrt{5}$ **(B)** $3\sqrt{2}$ **(C)** $2\sqrt{6}$ **(D)** $\sqrt{23}$ **(E)** $5\sqrt{1}$

8. $\sqrt{\frac{9}{100}+\frac{4}{25}}=$

   (A) $\frac{3}{10}\times\frac{2}{5}$ **(B)** $\frac{3}{10}\div\frac{2}{5}$ **(C)** $\frac{3}{10}-\frac{2}{5}$ **(D)** $\frac{1}{2}$ **(E)** $\frac{7}{10}$

9. $\frac{1}{\left(\sqrt{7\frac{2}{9}}\right)^7}\times\left(\sqrt{\frac{65}{9}}\right)^9=$

   (A) $7\frac{2}{9}$ **(B)** $7\frac{2}{9}\times7\frac{2}{9}$ **(C)** $\left(\sqrt{7\frac{2}{9}}\right)^{-2}$ **(D)** $\left(\sqrt{7\frac{2}{9}}\right)^{\frac{9}{7}}$ **(E)** $\left(\sqrt{7\frac{2}{9}}\right)^{16}$

10. Solving the following system for *m* by substitution would yield which equation in the process?

$$\begin{cases}5m-3n=6\\7m-n=8\end{cases}$$

    (A) $5m+21m+24=6$ **(B)** $5m-21m+24=6$ **(C)** $5m-21m-24=6$
    (D) $5m+21m-24=6$ **(E)** $5m-21m+18=6$

11. If the largest of three consecutive integers is $\frac{x+7}{9}$, what is the smallest of the three integers?

    (A) $\frac{x-11}{9}$ **(B)** $\frac{x+5}{9}$ **(C)** $\frac{x+4}{9}$ **(D)** $\frac{x-20}{9}$ **(E)** $\frac{x+25}{9}$

12. When $3x^3+5$ is divided by $x+1$, what is the remainder?

    (A) -8 **(B)** -2 **(C)** 2 **(D)** 3 **(E)** 8

13. $\dfrac{12(x+y)^3-6(x+y)^2}{6(x+y)^2}=$

(**A**) $12(x+y)^3$ (**B**) $12(x+y)^3-1$ (**C**) $2(x+y)$ (**D**) $2(x+y)-1$ (**E**) $6(x+y)-1$

14. What is the value of *k* if $kj^5-7j^2+5=0$ when $j+1=0$?

(**A**) -12 (**B**) -2 (**C**) $-\dfrac{2}{5}$ (**D**) 2 (**E**) 12

15. Find the distance between $(-x,y)$ and $(x,-y)$.

(**A**) $2x^2$ (**B**) $2x+2y$ (**C**) $2(x-y)$ (**D**) $2\sqrt{x^2+y^2}$ (**E**) $2\sqrt{x^2-y^2}$

16. Find the quotient for $\dfrac{x^2+6x+8}{x^3-16x}\overline{)\dfrac{x^2+8x+12}{x^2+2x-24}}$

(**A**) x (**B**) $\dfrac{1}{x}$ (**C**) $x+1$ (**D**) 0 (**E**) 1

17. If $ax^2+bx+c=0$, find the value of $\dfrac{ax^2}{c}+\dfrac{bx}{c}+3$ assuming $c\neq 0$.

(**A**) 0 (**B**) 1 (**C**) 2 (**D**) 3 (**E**) 4

18. If $\dfrac{a^7b^4}{c^6}<0$, which of the following *must* be negative?

(**A**) $b^2c^4a^6$ (**B**) $b^3c^4a^3$ (**C**) $c^3b^4a^5$ (**D**) $c^9b^7a^{11}$ (**E**) $b^6c^4a^{13}$

19. $\dfrac{3}{a}+\dfrac{2}{a}=$

(**A**) $\dfrac{5}{2a}$ (**B**) $\dfrac{5}{a}$ (**C**) $\dfrac{5}{a^2}$ (**D**) $\dfrac{6}{a}$ (**E**) $\dfrac{6}{a^2}$

20. What value(s) can *a* have if $ax^3-6x+3=0$ when *x* = -1?

(**A**) -9 (**B**) -3 (**C**) -1 (**D**) 3 (**E**) 9

21. You have *x* dollars made up of quarters and dimes and you have 4 more dimes than quarters. Which two equations would best describe this problem where *d* represents the number of dimes and *q* represents the number of quarters?

(**A**) $\begin{cases}d=q+4\\q+d=x\end{cases}$ (**B**) $\begin{cases}25q+10d=x\\d=q-4\end{cases}$ (**C**) $\begin{cases}25q+10d=100x\\d=q-4\end{cases}$ (**D**) $\begin{cases}25q+10d=100x\\d=q+4\end{cases}$ (**E**) $\begin{cases}25q+10d=x\\d=q+4\end{cases}$

22. If $wxyz=\sqrt{r}$ and x,y,z, and $r>1$, then $\dfrac{w}{xy}=$

(**A**) $\dfrac{\sqrt{r}}{x^2y^2z}$ (**B**) $\dfrac{\sqrt{r}}{z}$ (**C**) $\dfrac{\sqrt{r}}{xyz}$ (**D**) $\dfrac{z}{\sqrt{r}}$ (**E**) $\dfrac{xyz}{\sqrt{r}}$

23. If $y=mx+b$, find the value of $x+\dfrac{b}{m}$.

(**A**) $\dfrac{y}{m}$ (**B**) $\dfrac{y+b}{m}$ (**C**) $\dfrac{y-b}{m}$ (**D**) $\dfrac{m}{y}$ (**E**) $\dfrac{m+b}{y}$

24. What value can *f* have if $r=-2$ and $\dfrac{fr^4-r^3}{r^{16}}=r^{-15}$.

(**A**) $-\dfrac{8}{5}$ (**B**) $-\dfrac{5}{8}$ (**C**) $\dfrac{1}{8}$ (**D**) $\dfrac{3}{8}$ (**E**) $\dfrac{8}{3}$

25. Given $14-\dfrac{y+z}{3}\leq 6$, what is known about the sum of *y* and *z*?

(**A**) <24 (**B**) ≤ 24 (**C**) ≤ 11 (**D**) >24 (**E**) ≥ 24

ALGEBRA 2 TEST 3 ANSWERS

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

1. II

2. $\frac{4}{xyz}+\frac{3}{zyx}=\frac{7}{xyz}$

3. $x+1+2=x+3$

4. $2\sqrt{m}$

5. Choices A, B, C, and D are all true since multiplying both sides by a negative number will switch the direction of the sign. Since $a+b<c$ and $c<d$, then $a+b<d$. Therefore $\frac{a+b}{3}<\frac{d}{3}$ proving E false.

6. $\frac{b^3c^{-5}}{a^{-5}}$

7. $5\sqrt{1}=\sqrt{25\times 1}=\sqrt{25}$

8. $\sqrt{\frac{9}{100}+\frac{4}{25}}=\sqrt{\frac{9}{100}+\frac{16}{100}}=\sqrt{\frac{25}{100}}=\frac{1}{2}$

9. $\frac{1}{\left(\sqrt{7\frac{2}{9}}\right)^7}\times\left(\sqrt{\frac{65}{9}}\right)^9=\left(\sqrt{7\frac{2}{9}}\right)^2=7\frac{2}{9}$

10. $5m-3(7m-8)=6\rightarrow 5m-21m+24=6$

11. $\frac{x+7}{9}-2=\frac{x+7}{9}-\frac{18}{9}=\frac{x-11}{9}$

12. $(3x^3+5)\div(x+1)=3x^2-3x+3+\frac{2}{x+1}$

13. $\frac{12(x+y)^3-6(x+y)^2}{6(x+y)^2}=\frac{6(x+y)^2\ 2(x+y)-1}{6(x+y)^2}=2(x+y)-1$

14. $k(-1)^5-7(-1)^2+5=0\rightarrow -k-7+5=0\rightarrow k=-2$

15. $d=\sqrt{(x--x)^2+(-y-y)^2}=\sqrt{4x^2+4y^2}=\sqrt{4(x^2+y^2)}=2\sqrt{x^2+y^2}$

16. $\frac{x^2+8x+12}{x^2+2x-24}\div\frac{x^3-16x}{x^2+6x+8}=\frac{(x+6)(x+2)}{(x+6)(x-4)}\cdot\frac{x(x+4)(x-4)}{(x+4)(x+2)}=x$

17. Dividing $ax^2+bx+c=0$ by *c* yields $\frac{ax^2}{c}+\frac{bx}{c}+1=0$ or $\frac{ax^2}{c}+\frac{bx}{c}=-1$. Therefore $\frac{ax^2}{c}+\frac{bx}{c}+3=-1+3=2$.

18. b^4 and c^6 must be positive. Since $\frac{a^7b^4}{c^6}<0$, therefore *a* must be negative. Since it cannot be determined if *b* and *c* are positive or negative, the only choice that must be negative is $b^6c^4a^{13}$.

19. $\frac{3}{a}+\frac{2}{a}=\frac{5}{a}$

20. $-a+6+3=0\quad\rightarrow\quad a=9$

21. D

22. $\frac{wxyz}{x^2y^2z}=\frac{\sqrt{r}}{x^2y^2z}=\frac{w}{xy}$

23. Dividing each term by m results in $\frac{y}{m}=x+\frac{b}{m}$

24. Multiplying both sides by r^{16} results in $fr^4-r^3=r$. Substituting -2 in for *r* and simplifying results in $16f+8=-2$. Therefore $f=-\frac{5}{8}$.

25. Subtracting 14 from both sides and multiplying both sides by -3 results in $y+z\geq(6-14)(-3)\rightarrow\geq 24$