Algebra II – Final Exam

REVIEW

1. What is the vertex of the graph of $y=\frac{1}{4}(x-2)^2+6$?

   A. (0, 7) B. (2, 6) C. (-2, -6) D. (4, 7) E. (-2, 6)

2. What is a correct factorization of $x^2+6x-16$?

   A. $(x+8)(x-2)$ B. $(x+4)(x-4)$

   C. $(x-8)(x-2)$ D. $(x-4)(x-4)$

   E. $(x-8)(x+2)$

3. What are the solutions of $2x^2-3=13$?

   A. $\pm\sqrt{2}$ B. $\pm 2\sqrt{2}$ C. $2\sqrt{2}$ D. ± 2 E. $-\sqrt{2}$

4. What is the simplified form of the expression $\sqrt{162}$?

   A. $3\sqrt{18}$ B. $3\sqrt{54}$ C. $9\sqrt{18}$ D. $\sqrt{3}\sqrt{54}$ E. $9\sqrt{2}$

5. What does the product $(-5-2i)(3+7i)$ equal?

   A. $-15-14i^2$ B. $-1-41i$

   C. $-29-41i$ D. $-1+41i$

   E. $-29+41i$

6. What is the factorization of $f(x)=2x^3-x^2-5x-2$?

   A. $(x-2)(2x+1)(x+1)$ B. $(x-2)(2x-1)(x+1)$

   C. $(x-2)(2x+1)(x-1)$ D. $(x-2)(2x-1)(x-1)$

   E. $(x+2)(2x+1)(x-1)$

7. What are all the rational zeros of $f(x)=x^3+3x^2-13x-15$?

A. -3, -1, 5
B. -3, 1, 5
C. -5, -1, 3
D. -5, 1, 3
E. -1, 3, 5

8. What are all the real zeros of $f(x)=x^4+2x^3+x^2-4$?

A. $-2,-1$
B. $-2,1$
C. $-1,2$
D. $1,2$
E. $\pm 1,\pm 2$

9. How many zeros does the function $f(x)=-3x^4+2x^3+7x-5$ have?

A. 1 B. 2 C. 3 D. 4 E. 5

10. Which quadratic function in vertex form has a graph with the vertex $(-3,-6)$ and passes through the point $(2,-31)$?

A. $y=-(x+3)^2+6$
B. $y=(x+3)^2-6$
C. $y=-(x+3)^2-6$
D. $y=-(x-3)^2-6$
E. $y=(x+3)^2+6$

11. What is the simplified expression of $\left(\frac{2x^{-3}}{3y^{-4}}\right)^{-2}$?

A. $\frac{2x^6}{3y^8}$ B. $\frac{3y^8}{2x^6}$ C. $\frac{9y^6}{4x^5}$ D. $\frac{9y^8}{4x^6}$ E. $\frac{9x^6}{4y^8}$

12. What is the value of $f(x) = -8x^5 + 6x^4 - 5x^3 + 10x^2 + 9x - 1$ when $x = -1$?

A. 11 B. -9 C. 7 D. -11 E. 19

13. What is the result of dividing $3x^3 + 7x^2 + 5$ by $x + 1$?

A. $3x^2 + 10x + 10 + \frac{15}{x+1}$ B. $3x^2 + 4x + 4 + \frac{1}{x+1}$

C. $3x^2 - 10x + 10 - \frac{15}{x+1}$ D. $3x^2 - 4x - 4 + \frac{9}{x+1}$

E. $3x^2 + 4x - 4 + \frac{9}{x+1}$

14. Which cubic function is graphed?

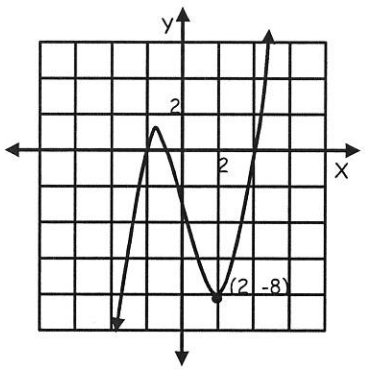
A. $f(x) = \frac{1}{3}(x-1)(x+2)(x-4)$

B. $f(x) = -\frac{1}{3}(x+1)(x+2)(x+4)$

C. $f(x) = \frac{1}{3}(x+1)(x+2)(x-4)$

D. $f(x) = 3(x-1)(x-2)(x+4)$

E. $f(x) = \frac{1}{3}(x+1)(x+2)(x+4)$



15. What is the value of $-64^{1/3}$?

A. 4 B. -4 C. $\frac{1}{4}$ D. $-\frac{1}{4}$ E. $\pm\frac{1}{4}$

16. Which of the following is an exponential decay function?

A. $f(x)=4\left(\frac{2}{3}\right)^{-x}$

B. $f(x)=3^{x}$

C. $f(x)=7\left(\frac{2}{5}\right)^{-x}$

D. $f(x)=2(5)^{-x}$

E. $f(x)=8\left(\frac{8}{3}\right)^{x}$

17. What is the simplified form of $5e^{-8}\bullet(-2e^{3})^{2}$?

A. $-10e^{-40}$ B. $-20e^{2}$ C. $\frac{20}{e^{2}}$ D. $\frac{20}{e^{48}}$ E. $\frac{10}{e^{2}}$

18. What is the approximation of $\log_{1/2}28$?

A. -0.208 B. -4.807 C. 0.807 D. -12.099 E. 8.099

19. What is the condensed expression for $3\log x-\log 2$?

A. $\log\frac{x^{3}}{2}$

B. $\log 2x^{3}$

C. $\log 2x^{-3}$

D. $\log\frac{x^{-3}}{2}$

E. $\log -2x^{-3}$

20. What is $f(-3)$ where $f(x)=\frac{50}{1+7e^{-x}}$?

A. 0.3342

B. 0.3487

C. 0.3531

D. 0.3672

E. 0.3915

21. What is the product $\frac{x^2-7x-44}{x^2+6x-16} \bullet \frac{x^2+17x+72}{x^2-2x-99}$?

A. $\frac{x+9}{x-2}$ B. $\frac{x-2}{x+4}$ C. $\frac{x+4}{x-2}$ D. $\frac{x-11}{x+9}$ E. $\frac{x+8}{x-2}$

22. What is the solution of $\log_4(2x-7)=\log_4(3x-13)$?

A. -2 B. 0 C. 6 D. 2 E. -6

23. What is the solution of $5^{x-2}+3=32$?

A. 4.085 B. 4.092 C. 4.096 D. 4.099 E. 4.102

24. What is the product $\frac{x^2-3x-10}{x^2-6x+5} \bullet \frac{x-1}{x^2-4}$?

A. $x-2$ B. $\frac{1}{x-2}$ C. $x+2$ D. $\frac{1}{x+2}$ E. $\frac{x-1}{x-2}$

25. What are all the solutions of the equation $\frac{-6}{x+7}=\frac{x}{2}$?

A. 3, 4 B. -3, 4 C. -4 D. -3 E. -4, -3

26. What is the difference $\frac{x+4}{x^2+6x+9}-\frac{1}{x^2-9}$?

A. $\frac{x^2-x-15}{(x+3)^2(x-3)}$ B. $\frac{x^2+x-15}{(x+3)^2(x-3)}$

C. $\frac{x^2-15}{(x+3)^2(x-3)}$ D. $\frac{x^2-15}{(x-3)^2(x+3)}$

E. $\frac{x^2+15}{(x+3)^2(x-3)}$

27. What is the solution of the equation $\frac{6}{x} - \frac{2}{3} = -\frac{4}{x}$?

A. 15 B. -2 C. -15 D. 3 E. 6

28. What is the value of $25^{-3/2}$?

A. ± 125 B. $\frac{1}{125}$ C. 125 D. $-\frac{1}{125}$ E. $\pm\frac{1}{125}$