



NAME:

GRADE:

TIME:

DATE:

**ALGEBRA II**

**CALCULATOR ALLOWED**

1. Which is equivalent to

$$\frac{x^2+12x+32}{x^2-16x+64} \cdot \frac{x^2-64}{x^2+8x+16} ?$$

- A.  $\frac{(x+8)^2}{(x-8)(x+4)}$   
 B.  $\frac{x+4}{(x-8)(x+8)}$   
 C.  $\frac{x+8}{x+4}$   
 D.  $x - 8$

2. Given  $f(x) = x^3 - 2x$ ,  
 $g(x) = x^2 - 4$ , and  
 $h(x) = g(x) - f(x)$ .  $h(3) = ?$

- A. -21  
 B. 19  
 C. 2  
 D. -16

3. A rectangle has length  $\sqrt{2} + 2\sqrt{3}$  feet and width  $7\sqrt{2} - 4\sqrt{3}$  feet, what is the perimeter?

- A.  $16\sqrt{2} + 12\sqrt{3}$  feet  
 B.  $8\sqrt{2} - 2\sqrt{3}$  feet  
 C.  $16\sqrt{2} - 4\sqrt{3}$  feet  
 D.  $12\sqrt{2} - 12\sqrt{3}$  feet

4. Simplify  $(6 + 5i) - (9i - 4)$

- A.  $1 - 3i$   
 B.  $2 + 4i$   
 C.  $10 - 4i$   
 D.  $15 - 3i$

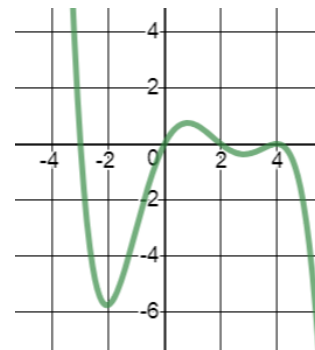
5. The graph of  $y = \frac{2}{3}(x - 7)^2 + 1$

- A. Opens up with a vertex of  $(7, 1)$   
 B. Opens down with a vertex of  $(-7, 1)$   
 C. Opens up with a vertex of  $(-7, -1)$   
 D. Opens down with a vertex of  $(7, -1)$

6. Let  $f(x) = x^3$ . Which transformation is equivalent to  $g(x) = -f(x - 2) + 1$ ?

- A.  $g(x) = -(x + 1)^3 - 2$   
 B.  $g(x) = (x - 2)^3 - 1$   
 C.  $g(x) = -2x^3 + 1$   
 D.  $g(x) = -(x - 2)^3 + 1$

7. Using the graph, decide if the following function has an odd or even degree and the sign of the lead coefficient



- A. odd degree; positive  
 B. odd degree; negative  
 C. even degree; positive  
 D. even degree; negative



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**8.** Given  $3^{4x} = 27^{2x-1}$ , find the value of  $x$

- A.  $x = 0.5$
- B.  $x = 1.5$
- C.  $x = 2$
- D.  $x = -3$

**9.** Given that  $\sin \theta = -\frac{1}{2}$  and  $\tan \theta < 0$  what is  $\cos \theta$ ?

- A.  $-\frac{\sqrt{3}}{3}$
- B.  $\sqrt{3}$
- C.  $-\frac{\sqrt{3}}{2}$
- D.  $\frac{\sqrt{3}}{2}$

**10.**  $a_1 = 34$  and  $d = -2$  find  $a_{22}$

- A. -8
- B. -2
- C. 0
- D. 6

**11.** Solve for  $x$ :

$$\frac{1}{3} + \frac{5}{4x} = \frac{1}{2}$$

- A.  $x = -\frac{1}{2}$
- B.  $x = \frac{15}{2}$
- C.  $x = 3$
- D.  $x = \frac{3}{2}$

**12.** What are the coordinates of the vertex of  $y = 3x^2 - 12x + 5$ ?

- A.  $(-2, 7)$
- B.  $(1, 5)$
- C.  $(2, -7)$
- D.  $(-1, -5)$

**13.** Find the zeroes of:

$$g(x) = (x^2 - 4x)(3x^2 + 9x - 12)(7x)$$

- A.  $x = \pm 2, 0, 4$
- B.  $x = -4, 0, \pm 2$
- C.  $x = 0, 1, \pm 4$
- D.  $x = 0, 2, 3, 4$

**14.** Write the equation of the function that has exponential growth, a  $y$ -intercept of  $-2$  and a horizontal asymptote of  $-3$ .

- A.  $y = \left(\frac{1}{4}\right)^x - 3$
- B.  $y = 5^x - 3$
- C.  $y = 3^x - 2$
- D.  $y = \left(\frac{1}{3}\right)^x - 2$

**15.** In New Jersey, the probability that a person owns skis is 50%, and the probability that they own both skis and a snowboard is 35%. What is the probability that a person owns a snowboard given that they already own skis?

- A. 70%
- B. 45.8%
- C. 34.1%
- D.  $28.\bar{3}\%$