

1. Solve.  $\frac{5x}{x-4} - \frac{6x+16}{2x-8} = \frac{-3}{2}$

$$x=4$$

$$R: x \neq 4$$

No Solution

2. Given the following functions, answer the questions below:

$$f(x) = \sqrt{2x-4} - 3$$

$$g(x) = \frac{x-5}{2} - 7$$

$$h(x) = \frac{(x+3)^2+4}{2}$$

a. Find  $f(g(39))$

1

b. Find  $g^{-1}(x)$

$$g^{-1}(x) = 2x + 19$$

c. Prove that  $f(x)$  and  $h(x)$  are inverses

$$\begin{array}{cc} f(h(x)) & h(f(x)) \\ \downarrow & \downarrow \\ x & x \end{array}$$

3. Solve using common bases or log properties.

a.  $\left(\frac{1}{8}\right)^{2x} = \left(\frac{1}{16}\right)^{x+2}$

$$x=4$$

b.  $\log_7 11 + \log_7 x = \log_7(x^2 + 24)$

$$x=3, x=8$$

c.  $4^{5x} = 81$

$$x=0.63$$

4. In 1926, the attendance at a Chicago Blackhawks game was 3318. Since then, attendance has been increasing at an average rate of 2% each year.

a. How many people were in attendance in 2014?

$$18,953.59 \rightarrow 18,953$$

b. When was attendance approximately 8000?

$$t=44.44$$

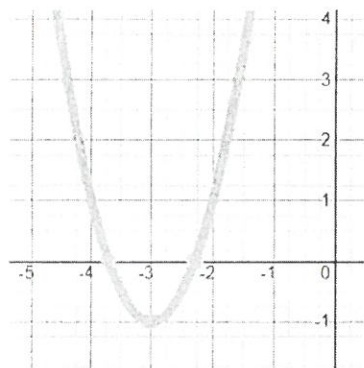
5. Find the set of equations that are equivalent. a, c, f

- a.  $y = (x - 4)(x + 6)$
- b.  $y = (x - 1)^2 + 25$
- c.  $y = x^2 + 2x - 24$
- d.  $y = 2x^2 + 8x - 24$
- e.  $y = (x + 4)(x - 6)$
- f.  $y = (x + 1)^2 - 25$

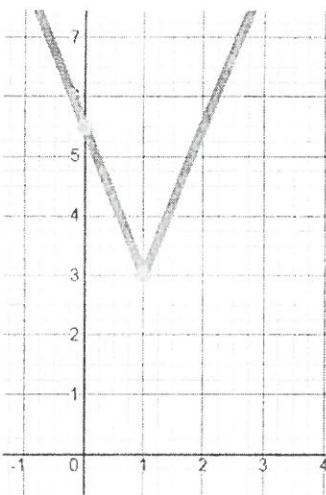
Match each equation with the appropriate graph.

A. $y = -2(x + 3)^2 - 1$	B. $y = \frac{1}{2}(x + 3)^2 - 1$	C. $y = -\sqrt{x - 2} + 4$	D. $y = \frac{5}{2} x - 1  + 3$
E. $y = 4\sqrt{x - 5} - 2$	F. $y = \frac{5}{2} x + 1  - 3$	G. $y = -2x + 7$	H. $y = 2(x + 3)^2 - 1$

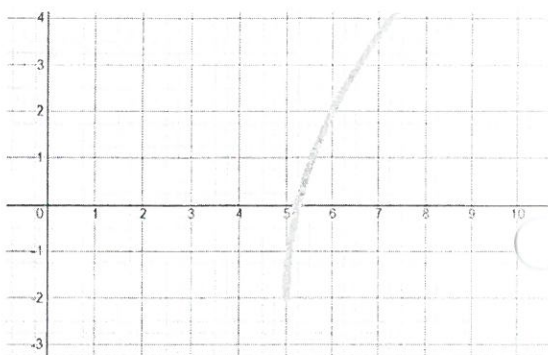
6. ~~H~~ H



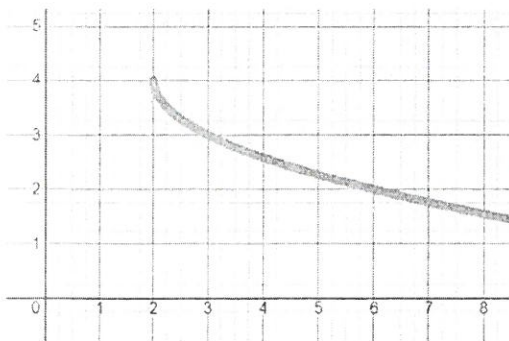
7. D



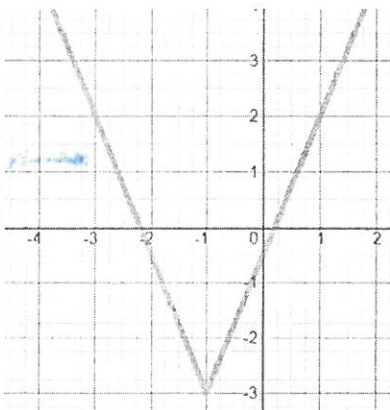
8. E



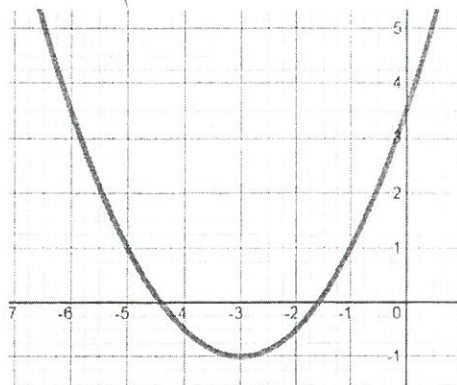
9. C



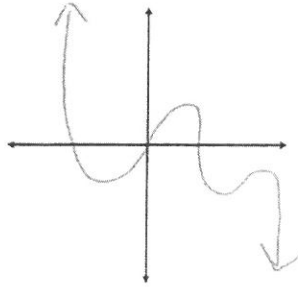
10. F



11. ~~B~~ B



12. Sketch a polynomial with a degree of 5, 3 real roots, and a negative leading coefficient.



13. Perform the indicated operation, put the resulting polynomial in descending order, and then fill in the blanks below.

$$(3x^2 - 9 + 7x)(8 + 2x^2 - 4x)$$

Answer in descending order:  $6x^4 + 2x^3 - 22x^2 + 92x - 72$  Degree: 4 Leading coefficient: +

Classify your answer: (circle one) Monomial      Binomial      Trinomial      Polynomial

Error Analysis

For questions 14 & 15: Circle the error in each problem and explain how to correct the error.

14. Divide.  $3x^3 + 4x^2 + 7x + 22 \div (x - 2)$

$$\begin{array}{r|rrrr} 2 & 3 & 4 & 7 & 22 \\ & & 6 & -4 & 22 \\ \hline & 3 & -2 & 11 & 0 \end{array}$$

Answer:  $3x^2 - 2x + 11$

15. Simplify.  $(-6 + 7i)(2 - 9i)$

$$\begin{aligned} & -12 + 54i + 14i - 63i^2 \\ & -12 + 54i + 14i - 63 \\ & -75 + 68i \end{aligned}$$

