1. A	7. D	13. C	19. A	25. D
2. D	8. D	14. D	20. D	26. E
3. B	9. E	15. C	21. E	27. B
4. D	10. D	16. A	22. B	28. C
5. A	11. B	17. B	23. D	29. D
6. B	12. A	18. A	24. A	30. C

The following were changed at the resolution center at the convention:
8 B, 9 D, 17 E, 20 E, 22 E

1. **A**. $\frac{(7a-2)-(7b-2)}{a-b}=\frac{7(a-b)}{a-b}=7$

2. **D**. f is a line with positive slope; g is a line with negative slope; h is a line with 0 slope; k is a line with positive slope. f and k are increasing.

3. **B**. $f^{-1}(x): x=\frac{2y-5}{3}$ solves to $y=\frac{3x+5}{2}$

4. **D**.

5. **A**. Substituting shows that all three points line on the curve in choice A.

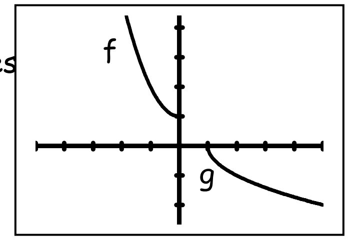
6. **B**. An even function has the property that $f(-x)=f(x)$ for all x, and even powers are a clue to some even functions. II and IV do not change for f(-x). Choice A has f(-x) = $(-x-9)^2+4$ and for x= -1 we see a different answer than x=1.

7. **D.** Let x=3: $f(3)=\frac{f(1)}{f(2)}$=10. Let x=5: $f(5)=\frac{f(3)}{f(4)}=20$ so $\frac{10}{f(4)}=20$ and $f(4)=1/2$. So f(3), f(4), f(5) are 10, 1/2, 20 and by the formula, we can multiply two consecutive terms to get the term previous to both. So f(2)=5, f(1)=50, f(0)=250. Then we have the sequence 250, 50, 5, 10, 1/2, 20 and we can verify each term by letting x=0 through x=5 or further. f(0)=250.

8. **D.** D. Divide to get $\frac{(y-1)^2}{B}-\frac{(x+2)^2}{4}=1$ which has asymptotes with slope $\frac{\sqrt{B}}{2}$.
Since this is equal to 3/4 (original line given) then we have B=9/4.

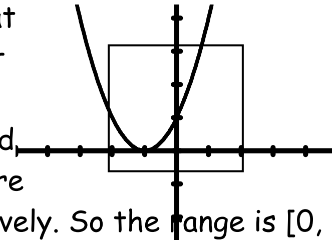
9. **E**. Since 3 times each term of f does not give g, A is not true. Similarly adding 3 to f does not give g, so B is not true. For c, we consider $(x-3)^3-10(x-3)^2+27(x-3)-18$ and let x=3. This gives for C, f(3)= -18. But g(3)= 27-90+27-18, not -18. So C is not true.
Similarly D is not true, and the answer is E.

10. **D**. $g(x)=-\sqrt{x-1}$ and f and g are shown.



As x increases the g(x) decreases so A is false. g has domain [1, ∞) and g(1)= f(0)=1. D is true.

11. **B**. Knowing that the vertex is at (-1, 0), we need to find f(-2) and f(2), and they are 1 and 9 respectively. So the range is [0, 9].



12. **A**. When the sine is 1, we have the maximum. The period of this graph is $2\pi/(160\pi)$ = 1/80. From x=0 to 1/80, we have 1 max point. So $\frac{1 \max}{1/80}=\frac{n}{1}$ and so n=80.

13. **C**. Since x=5 makes f undefined and g has domain $x>-4$, the intersection is C.

14. **D**. When x and y are substituted by –x and –y, we should get an opposite answer. Since choice C has odd powers, $(-x)+(-y)^3$ $=-(x+y^3)$.

15. **C.** $3\ln(e^5)-1=3(5)-1=14$.

16. **A**. When x=1/2, $3x^{3/2}-\frac{\sqrt{x+1}}{|x-2|}\le x$ (simplified) gives $\frac{3}{2\sqrt{2}}-\frac{\sqrt{3/2}}{3/2}$ = $\frac{3\sqrt{2}}{4}-\frac{1}{\sqrt{3/2}}=\frac{3\sqrt{2}}{4}-\frac{\sqrt{2}}{\sqrt{3}}$ = $\frac{3\sqrt{2}}{4}-\frac{\sqrt{6}}{3}$ = $\sqrt{2}(\frac{3}{4}-\frac{\sqrt{3}}{3})$ ≈1.4 (.75-1.7/3) ≈1.4(.75-.6) = 1.4(0.15) = 0.21 < 0.5. Choice A.

17. **B**. Since sine has range [-1, 1], the range of f is -4 ± 1.

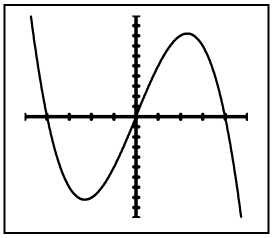
18. **A**. $x(x-4)(x+4)\neq 0$.

19. **A.** $\sqrt{3^2+3^2}=3\sqrt{2}$

20. **D**. For Choice A, if b=2, (a+5)≥ 0. True.
For Choice B, if b= -6, then (a+5)≤ 0, True.
For Choice C, if b= -4, then (a+5)≤ 0, True.
For Choice D, if b= -2, then (a+5)≤ 0, False.
The answer is then **D**.

21. **E.** Phase shift is -1/π.

22. **B.** The equation has roots at -4, 0 and 4. Knowing the shape of the graph, we see that over that interval, the value is negative after x=4. So only at x=5 and x=6 do we have negative values.



23. **D**. The slope of an asymptote is 3/4 and putting the conic in the form $\frac{(y-1)^2}{B}-\frac{(x+2)^2}{4}=1$ gives the slope of asymptotes $\frac{\sqrt{B}}{2}$. Setting this equal to 3/4 gives B= 9/4.

24. **A**. The sum of the two irrational roots is 3 and the product is 7, so x^2-3x+7 is a factor of f. Multiply by (x-4) to get choice A.

25. **D**. $\cos(\Omega+\varphi)=\cos\Omega\cos\varphi-\sin\Omega\sin\varphi$
$=\frac{24}{25}\square\frac{4}{5}-\frac{7}{25}\square\frac{3}{5}=\frac{75}{125}=\frac{3}{5}$.

26. **E**. The polynomial factors to $(x+2)^3(x+4)$ so the distinct roots are -2 and -4.

27. **B**. Let the roots be a, -a and b. The sum of the roots is then b, and since –B/A (coefficients) gives the sum is -3, then b= -3. The product of the roots is E/A=-12, then $-3a^2=-12$ gives the other roots are 2 and -2. For x= any of these roots, set the polynomial =0 to get k= -4.

28. **C**. Sec(3x)=$\sqrt{2}$ for $\frac{\pi}{4}$ and $\frac{7\pi}{4}$, $2\pi+\frac{\pi}{4}$ and $2\pi+\frac{7\pi}{4}$, and $4\pi+\ldots$
Since is equal to 3x, we get x= $\frac{\pi}{12},\frac{7\pi}{12},\frac{9\pi}{12},\frac{15\pi}{12},\frac{17\pi}{12},\frac{23\pi}{12}$. Sum is 6π.

29. **D**. y= $\frac{(2x+1)(x+5)}{(x+12)(x-10)}$ has vertical asymptotes where the function is undefined. At x= -12, x=10, choice D.

30. **C**. The sum of the zeros is –B/A = 1/2.