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

6. B
7. E
8. A
9. B
10. B

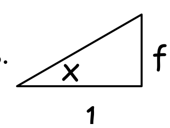
11. C
12. A
13. C
14. B
15. D

16. D
17. D
18. E
19. C
20. D

21. B
22. C
23. A
24. B
25. D

26. B
27. B
28. C
29. D
30. D

1. **B**. $2x-1=2,\ x=3/2$
2. **A**. Since g and f are inverses, g(3)=5 and so g(3)+g(f(2))= 5+2= 7.
3. **D**. Since |x|= -x for x<0, A=|-x-3|. But now -x-3 is positive for x< -3 so A= -x-3.
4. **B**. (x-4)(x+1)<0 for (-1, 4) which includes integers 0, 1, 2, 3. Four values.
5. **A**. f(2)=0, 8-40+2A+B=0, 2A+B= 32. Since A+B=9, A=23 and B=-14. f(1)= 1-10+23-14 = 0.
6. **B**. $g(2x)=2(2x)^{\frac{2}{3}}=2^{\frac{11}{3}}$; so $2^{\frac{5}{3}}x^{\frac{2}{3}}=2^{\frac{11}{3}}$ and $x^{\frac{2}{3}}=2^{\frac{6}{3}}$, $2^{\frac{6}{3}\bullet\frac{3}{2}}$. x=8.
7. **E**. Since Arccotx is defined only over [0, π], x=$\frac{5\pi}{6}$.
8. **A**. The function is equal to 1 where it isdefined.
9. **B**. f(x)=f(-x) and g(-x)= -g(x) by the definitions of even and odd functions. f(g(1))=f(3)=8. g(-1)= -g(1)= -3. f(-2)=f(2)=3. The sum is 8.
10. **B**. The equation completes to $4(y-2)=(x-1)^2$, so the vertex is (1, 2) and the focus is (1, 3) and the directrix is y=1. So b=3.
11. **C** This graph is a semicircle of radius 3. Area is 1/2 times 9π = 9π/2.
12. **A**. Since the slope is 1/2, the angle of inclination is the Arctan(0.5).
13. **C**. The sum of the roots is –B/A so the sum is 10. One root is 2; the others add to 8.
14. **B**. The hypotenuse is $\sqrt{1+f^2}$ so the value for sine is f divided by this.



15. **D**. All roots are complex.
16. **D**. f is the sum $\sin(x+\pi/2-x)$ which equals 1.
17. **D**. $\frac{1}{4}=\frac{\sin x}{1-1/4}$, so sinx=3/16.
18. **D**. $\frac{4911+x}{1274+4911+x}=0.8$ solves to 185 more games.
19. **C**. This value occurs in every quadrant, due to the absolute value of sine. Starting in QII for the first term, QIII for the second, QIV for the third, $a_3=\frac{5\pi}{3}$
20. **D**. Use the Pythagorean Th: I, III, IV.
21. **B**. $2+2\log 3=\log 100+\log 9=\log 900$. 900=$(x(x+1)(x+3))^2$, 300=x(x+1)(x+3) and since 300=2(3)(5), x=2. l
22. **C**. The max occurs at $(\pi/2,1)$ so the center of the circle is $(\pi/2,1/2)$ and the radius is 1/2, so c=1/4. $\frac{\pi}{2}\bullet\frac{1}{2}\bullet\frac{1}{4}=\frac{\pi}{16}$.

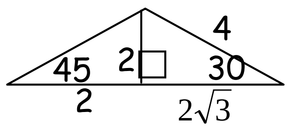
23. **A**. $V=\frac{4}{3}\pi r^3$, $r=\sqrt[3]{\frac{3V}{4\pi}}$

24. **B**. The probability that it will rain on both days is 0.3 times 0.8 (from 4/5) which is 0.56. One subtract this gives probability 0.44 which is 11/25 which gives odds 11:14.

25. **D**. P=$\frac{blue}{total}=\frac{x-(x-2)}{x}=\frac{2}{x}$. Set this equal to 2/100 and we get x=100.

26. **B**. $f=\frac{1}{x(x-1)}$. Let x= $\frac{1-i\sqrt{3}}{2}, x-1=\frac{-1-i\sqrt{3}}{2}$. The product is -1 and its reciprocal is also -1.

27. **B**



Area is 1/2 times bh, or $\frac{1}{2}(2)(2+2\sqrt{3})$ or choice B.

28. **C**. The G.M. gives $\sqrt{(RS)(ST)}=\frac{1}{4}(12)$ so RS times ST equals 144. The area (A) is $\frac{1}{2}(RS)(ST)\sin S$ and we set this equal to 48. This solves to sinS=k=2/3.

29. **D**. The first sequence is 6, 6r, $6r^2$ and $6r^2-6r=18-6r^2$ which solves to r= -1 or r=3/2. Since all terms are positive, we have r=3/2. So the terms are 6, 9, 27/2, and 18. The product of the middle two is 121.5.

30. **D**. $2x^2+2x+1=265$; $2x^2+2x-264=0$ and $x^2+x-132=0$ so (x-11)(x+12)=0 so x=11. And 5(11)-5=50.