no calculator allowed

The abbreviation "NOTA" means "None of These Answers."

1. If $a \neq 0$ how many real solutions exist for the equation $(a)(a) = a^a$?

   A. 0 B. 1
   C. 2 D. 4
   E. NOTA

2. How many digits are in the product $2^{12} \bullet 5^8$?

   A. 8 B. 10
   C. 12 D. 13
   E. NOTA

3. How many integer values of x make the inequality $\frac{x+1}{x-2} > 3$ true?

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

4. $f(x) = 2x^5 - 3x^4 + 8x^3 + x^2 + 1$ has roots $a_1, a_2, a_3, a_4,$ and a_5, then what is the value of $a_1a_2 + a_1a_3 + a_1a_4 + a_1a_5 + a_2a_3 + a_2a_4 + a_2a_5 + a_3a_4 + a_3a_5 + a_4a_5$?

   A. -4 B. $-\frac{3}{2}$
   C. $\frac{3}{2}$ D. 4
   E. NOTA

5. The value of $2^{100} - 2^{98}$ has how many distinct positive prime factors?

   A. 200 B. 198
   C. 2 D. 1
   E. NOTA

6. If $\log_9(6x + 40) = 2 + \log_9\left(\frac{x}{3}\right)$ then what is the value of $42x$?

   A. 80 B. 40
   C. 20 D. 16
   E. NOTA

7. If $x^2 = 32$ and $y^2 = 18$ then give the greatest possible value of $\sqrt{2} \bullet |x$ [illegible] $y|$?

   A. 7 B. 14
   C. 49 D. 50
   E. NOTA

8. The common log of a googol is ___.

   A. 10 B. 100
   C. 10^6 D. 10^{100}
   E. NOTA

9. If $\begin{vmatrix} x & -1 & -3 \\ -1 & 2x & \frac{1}{2} \\ 0 & -1 & 2 \end{vmatrix} = -\frac{1}{2}x$ and x is an integer then $x =$

   A. -2 B. -1
   C. 1 D. 2
   E. NOTA

no calculator allowed

10. If K is the positive geometric mean between the sequence terms $5\sqrt{2}+1$ and $5\sqrt{2}-1$, then K=

A. 5 B. 6
C. 7 D. 8
E. NOTA

11. Karl buys x melons and each costs $\$(10-x)$. What is Karl's maximum total cost?

A. \$5 B. \$17.50
C. \$25 D. \$75
E. NOTA

12. The expression $2x^2+8\sqrt{2}x+16$ can be factored over reals as $A(x+\sqrt{B})^2$ for $A>0$ and A and B are integers. Give the value of $\frac{B^2}{A}$.

A. 4 B. 8
C. 16 D. 32
E. NOTA

13. $\sum_{n=0}^{\infty}\frac{1}{3}\left(\frac{3^{n+1}}{4^n}\right)$ =

A. 4 B. 3
C. $\frac{7}{4}$ D. $\frac{4}{3}$
E. NOTA

14. If $a@b=2b^2-a$ then give the value of $3@(1@2)$.

A. 447 B. 95
C. 11 D. -3
E. NOTA

15. For how many integral values of x is $x^2-x<12$?

A. 8 B. 7
C. 6 D. 5
E. NOTA

16. If $\frac{2^{p-3}}{8^{p+1}}=\frac{1}{2}$ then give the value of $\frac{1}{4^p}$.

A. 32 B. $\frac{1}{2}$
C. $-\frac{1}{32}$ D. -2
E. NOTA

17. A jar contains \$5.35 in quarters and dimes and nickels. What is the least possible number of coins, if there is at least one of each coin?

A. 102 B. 25
C. 24 D. 23
E. NOTA

18. Given $f(x)=x^2-2|x|$, consider $g(x)=f(x+2)$. If k is the least value of x for which $g(x)=-1$ then give the value of $4k-1$.

A. -3 B. -4
C. -13 D. -15
E. NOTA

19. Three consecutive multiples of 4 have the property that the sum of twice the first and the third is 12 more than twice the second. Give the value of $\frac{5}{4}$ times the second number.

A. 12 B. 15
C. 20 D. 25
E. NOTA

20. If $3x+5y=-11$ and $2x-3y=18$ then give the value of $\frac{3}{x}-\frac{8}{y}$.

A. 2 B. 3
C. 4 D. 6
E. NOTA

21. If x is decreased to y then the percent of decrease is 20. What is the value of $\frac{y}{x}$?

A. 80 B. 40
C. 1.25 D. 0.8
E. NOTA

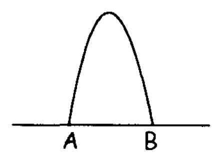
22. What is the coefficient of the x^{-3} term in the expansion of $\left(\frac{3}{x^3}-\frac{x^2}{3}\right)^6$?

A. 180 B. 20
C. -20 D. -180
E. NOTA

23. $\log_{0.25}30$ is between what two consecutive integers?

A. -4 and -3 B. -3 and -2
C. -2 and -1 D. 3 and 4
E. NOTA

24. A parabolic arch is 100 feet tall at its tallest point (its vertex), and its base points (A and B shown) are 80 feet apart. How tall is the arch 10 feet from its center?



A. 75 feet B. $\frac{175}{2}$ feet
C. $\frac{375}{4}$ feet D. 94 feet
E. NOTA

25. $d-2<0$ and $c-4>0$. Which is the value of $|d-2|-|c-4|$?

A. $c-d+2$ B. $d-c+2$
C. $6-c-d$ D. $c+d-6$
E. NOTA

26. If $\sqrt{a+\sqrt{a+\sqrt{a+\sqrt{\ldots}}}}=\sqrt{2}+1$ then give the value of a^2-2a+1

A. $1+2\sqrt{2}$ B. $1+\sqrt{2}$
C. $3+\sqrt{2}$ D. $3+2\sqrt{2}$
E. NOTA

27. Find the least positive integral value of k which makes the solutions $3x^2-2kx=5$ rational.

A. 4 B. 5
C. 15 D. 16
E. NOTA

28. A clock has its 10 inch long second hand "stuck" so that the hand reaches the 9 on the clock, and jumps back to the 8, then moves again to the 9 and jumps to the 8, and so on. If the movement from 8 to 9 takes 5 seconds and the "jump back" takes 1 second, then find how many inches the tip of the second hand moves in 1 minute, if we begin measuring (t=0) when the 5-second clockwise movement begins, and we end at t= 1 minute when the hand is in the same place as at t=0.

A. $\frac{10}{3}\pi$ B. $\frac{5}{3}\pi$
C. 10π D. $\frac{100}{3}\pi$
E. NOTA

29. Jack and Jill played games of chess. The person who won paid the other person 1 piece of candy. They "run a tab" until the end of all of the games. At the end of the games, Jack paid Jill 9 pieces of candy, although Jack had won 8 games! If there were no ties/draws, how many games were played?

A. 17 B. 18
C. 25 D. 26
E. NOTA

30. For $S=\{1,2,3,4,5,6,7,8\}$ and $f(x,y)=x^{\frac{x}{y}}$ where the value of x and y are distinct members of set S. How many different rational values of f exist?

A. 12 B. 13
C. 15 D. 16
E. NOTA

ERRATA

ALL ANSWERS Florida Invitational MIDDLETON TIGERS Feb 24, 2007

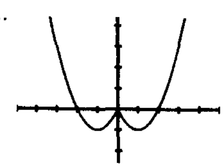
NO CALCULATORS!

	Algebra I	Geometry	Algebra II	Pre-Calc	Calculus	Statistics	Theta Open	Alpha Open	Statistics Open
	none	1	none	none	1	none	none	none	2
1	C	A	C	B	D	B	B	A	C
2	B	C	B	D	A	C	C	B	D
3	A	C	A	C	A	A	C	A	C
4	D	B	D	A	B	D	D	D	B
5	D	D	C	E	C	B	B	C	A
6	B	D	A	B	~~B~~ E	C	D	C	D
7	B	D	B	D	D	D	A	C	C
8	C	A	B	B	B	C	C	A	~~C~~ → B
9	C	A	C	B	C	C	D	D	A
10	C	C	C	A	A	A	C	B	D
11	A	B	C	C	D	C	B	A	A
12	D	C	D	C	C	B	B	B	B
13	A	A	A	D	D	B	B	B	A
14	B	A	B	C	B	A	A	C	C
15	E	C	C	B	A	D	A	B	D
16	B	D	A	D	C	C	B	A	D
17	C	B	C	A	A	B	B	C	B
18	C	C	C	C	A	D	D	D	A
19	B	B	C	A	D	D	A	D	A
20	B	B	B	D	D	B	D	B	C
21	D	C	D	C	A	B	B	B	D
22	C	D	C	B	C	A	D	C	C
23	C	C	B	A	C	A	A	D	B OR E
24	A	D	C	C	A	B	D	D	D
25	D	B	C	B	D	A	B	C	C
26	B	~~C~~ D	D	A	D	C	C	C	~~A~~ → B
27	B	A	E	C	D	D	D	C	C
28	D	D	D	D	B	D	B	B	C
29	C	C	C	C	A	C	B	A	C
30	C	B	B	D	B	A	D	C	C

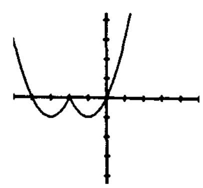
Solutions:

1. C. a=1 and a=2.
2. B. $2^8 5^8 (2^4) = 16 \times 10^8$ which has 10digits.
3. A. Solve $\dfrac{x+1}{x-2} = 3$ to get x=7/2. And on the number line put x=2 (domain issues). Check intervals and see that (2,3.5) is the interval solution. The only integer in that interval is 3, so the answer is "one" value of x.
4. D. The sum of the roots taken two at a time c/a, which is 8/2=4.
5. C. Factor $2^{98}(2^2 - 1) = 2^{98}(3)$ which has prime factors 2 and 3.
6. A. Change 2 to $\log_9 81$ and use properties of logs to get $\log_9(6x+40) = \log_9(\frac{81x}{3})$ so 6x+40=27x solves to 40/21, and times 42 gives 80.
7. B. $x = \pm 4\sqrt{2}$ and $y = \pm 3\sqrt{2}$ so the greatest difference is $7\sqrt{2}$ times $\sqrt{2}$ gives 14.
8. B. A googol is 10 to the 100th power.
9. C. $(4x^2 - 3) - (-\frac{1}{2}x + 2) = -\frac{1}{2}x$
   $4x^2 + x - 5 = 0$ solves to x=1 or -5/4. The integer answer is 1.
10. C. Multiply and take the square root.
11. C. His total cost is x(10-x) which is a parabolic curve with maximum at its vertex which occurs at x=5 since roots are 0 and 10. At x=5 the cost is 25.
12. D. Factor out 2 to get $x^2 + 4\sqrt{2}x + 8 = 0$ which factors to $(x+\sqrt{8})(x+\sqrt{8})$ so A=2, B=8 and BB/A is 64/2 = 32.
13. A. The sum of an infinite geometric series is $\dfrac{a_1}{1-r}$ = $\dfrac{1}{1-\frac{3}{4}}$ = 4.
14. B. For the parentheses, a=1, b=2 and we get 7. For 3@7 we get 98-3=95.
15. C. $x^2 - x - 12 < 0;\ (x-4)(x+3) < 0$ and this is a parabolic curve with the interval (-3, 4) below the x-axis. Integer values in that interval are -2, -1, 0, 1,2,3, and this is 6 values.
16. A. Cross multiply to get $2^{p-3+1} = 2^{3(p+1)}$ which solves to p= -5/2. $\dfrac{1}{2^{2(-5/2)}} = \dfrac{1}{2^{-5}} = 32$
17. C. Divide by 0.25 to get 21 quarters but but then we see that we do not have one of each coin. So we use 20 quarters, and that leaves 35 cents. We can have 3 dimes and a nickel for 35 cents with 4 extra coins. 24 coins total.
18. C. f is an even function so we have a parabolic curve with roots 0 and 2, and then we reflect it over the y-axis. For g we shift this curve to the left 2 units.

f ...



g...



Now, we can find the value of f at x=1 to get the min point and we see that it is (1,-1) and so the graph of g hits y= -1 twice. Once at x=-1 and once at x= -3. So 4(-3)-1=-13.

19. C. Use a, a+4 and a+8. So 2x+(a+8)=12+2(a+4) to get a=12 is the first. 5/4 times 16 (the second) is 20.
20. B. Solve the system to get x=3 and y= -4. 3/3-8/(-4)=1+2=3.
21. D. $\dfrac{x-y}{x} = \dfrac{1}{5}$ since 1/5 is 20%. Distribute to get $1 - \dfrac{y}{x} = \dfrac{1}{5}$ and so y/x is 4/5.
22. C. $C(6,n)\left(\dfrac{3}{x^3}\right)^{6-n}\left(-\dfrac{x^2}{3}\right)^n$ must have power -3 on x. So $2n - 3(6-n) = -3$ solves to 5n-18=-3 and n=3. So our coefficient is C(6,3)=20 times 3 to the power of 3, divided by (-3) to the power

of 3, for a total of -20.

23. B. $\left(\frac{1}{4}\right)^x = 30; 4^{-x} = 30$ and since the power of 4 must be between 2 and 3, -x=2 and -x=3 gives our bounds.

24. C. Let the vertex be (0, 100) and B be (40,0) to get $y-100 = ax^2$ and use point B to get $a = -\frac{1}{16}$. Now let x=10 to get 375/4.

25. C. Since d-2<0, we negate the value of d-2 to get its abs. value. So 2-d - (c-4) gives 6-c-d.

26. D. Square to get $a + \left(\sqrt{2}+1\right) = \left(\sqrt{2}+1\right)^2$ and $a + \left(\sqrt{2}+1\right) = 3 + 2\sqrt{2}$ so $a = 2+\sqrt{2}$ so $a^2 - 2a + 1 = (a-1)^2 = (1+\sqrt{2})^2$ $= 3+2\sqrt{2}$.

27. E. Use the discriminant to get $4k^2 + 4(15)$ must be a perfect square. Factor out 4 to get $k^2 + 15$ must be a perfect square. This first happens when k=1.

28. D. The jump-up-jump-back routine takes 6 seconds. So 10 of these happen in 60 seconds. Now, in each of these routines, the hand covers 60 degrees. so $10(\frac{60}{360} \bullet 20\pi)$ gives $100\pi/3$.

29. C. Jack must have won 8 and Jill 17 for a total of 25.

30. B. $1^{\frac{1}{y}}$ gives only value **1**. $2^{\frac{2}{y}}$ gives **4**. $3^{\frac{3}{y}}$ gives **27**. $4^{\frac{4}{y}}$ gives values for y=1,2 and they are **256 and 16**. Then we get $5^5, 6^6, 6^{\frac{6}{2}}, 6^{\frac{6}{3}}, 7^7$ which give 5 new values.

Finally we get $8^{\frac{8}{y}}$ which gives values for y=1, 2, 3, 4, 6 although when y=4 we get 64 which was already listed. Same with y=6 since it is 16. And when y=6 we get 256, which was already listed. So our values are

{1, 4, 27, 16, 64, 256, $5^5, 6^6, 6^{\frac{6}{2}}, 6^{\frac{6}{3}}, 7^7$, 8^8, 8^4} which gives 13 values.

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ALGEBRA II TEAM Question #1 No Calculator

Use $f(x)=\sqrt{1+\sqrt{x}}$ for question #1, all parts.

$A=f(f(225))$.

$B=f^{-1}(4)$

C = the value of x for which $f(x-1)=2$.

D = the value of x for which $f\left(\frac{1}{x}\right)=2$.

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ALGEBRA II TEAM Question #2 No Calculator

Use $a=\sqrt{-4}$ and $b=\sqrt{-9}$ for question #2, all parts.

$A=a \bullet b$

$B=\frac{a}{b}$

$C=a+b$

$D=(a+b)^2$

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ALGEBRA II TEAM Question #3 No Calculator

Use $f(x)=(x-2)^{10}$ and $i=\sqrt{-1}$ for question #3.

$A=$ the coefficient of the 3rd term of the expansion of f.

B = the value of $f(i+1)$.

C = $f(\sqrt{2}+2)$.

$D=\dfrac{f(4)}{f(3+i)}$.

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ALGEBRA II TEAM Question #4 No Calculator

Use the equation $x^2-y^2-2x+4y=7$ for question #4.

$A=$ the length of the transverse axis of the graph.

$B=$ the positive slope of an asymptote of the graph.

$C=$ the value of the constant c of the equation of the asymptote $ax-by=c$, for $a>0, b>0$ and a and b have no common factors except 1.

$D=$ the distance from the center of the graph to a focus.

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ALGEBRA II TEAM   Question #5   No Calculator

In a jar there are 20 liters of a 10% saline (salt) solution.
The jar contains only salt and pure water. Use this information for #5, all parts.

$A =$ the amount of pure salt that must be added (in liters) to produce a 12% solution.

$B =$ the percent of salt that will be in the jar if 5 liters of a 20% solution are added.

$C =$ the percent of increase in solution (mixture) if 5 liters of solution are added.

$D =$ the amount of water that must be evaporated (leaving the same amount of salt) to produce a 25% saline solution.

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ALGEBRA II TEAM   Question #6   No Calculator

For each case, give the LEAST integer which is a solution of the inequality.

$A =$ the least integer x which is a solution of $4-|x+5|>0$.

$B =$ the least integer x which is a solution of $2x-x^2+15>0$.

$C =$ the least integer x which is a solution of $\sqrt{9-x^2}>1$.

$D =$ the least integer x which is a solution of $|x-1|<4$.

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ALGEBRA II TEAM Question #7 No Calculator

Use the set $S = \{1,3,5,6,8\}$ for question #7, all parts.

A = the probability that a number chosen at random from S is a positive integer factor of 40.

B = the probability that any two distinct numbers chosen at random from S has a sum greater than 11.

C = the probability that one number from S is randomly chosen and, given that the chosen number is odd, it is 3 or 5.

D = the probability that three numbers are randomly chosen from S and the sum of the three numbers is 9.

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ALGEBRA II TEAM Question #8 No Calculator

Use $f(x) = x^2 - 4x + 4$, $g(x) = (x-1)^2 + 1$ and $h(x) = x^2 - 6x + 5$ for question #8.

$A =$ the number of functions (above) which have at least one real root.

$B =$ the number of negative values of g which exist over the domain $[-10,10]$.

$C =$ the value of $f(g(3))$.

$D =$ the value of k so that the quadratic $y = x^2 - x + k$ has a root which is the same as the least root of h.

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ALGEBRA II TEAM Question #9 No Calculator

$$A=\sqrt{5+\sqrt{5+\sqrt{5+\sqrt{\ldots}}}}$$

$$B=\cfrac{2}{1+\cfrac{2}{1+\cfrac{2}{1+\ldots}}}$$

$C=$ the value of x which makes $\sqrt{x-\sqrt{x-\sqrt{x-\sqrt{\ldots}}}}$ equal to 10.

$D=$ the 12th term of the sequence 1, 1, 2, 3, 5, 8, ...

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ALGEBRA II TEAM Question #10 No Calculator

Use L as the line with equation $3x-6y=6$ and P as line $y=3x-6$ for question #10.

A = the value of k so the line $5x+ky=9$ is perpendicular to line L.

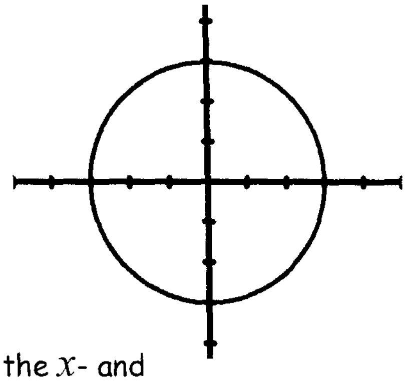
B = the value of u so that the line P intersects the parabola $y=ux-3x^2$ at the point $(1,-3)$.

$C=$ the sum of $a+b$ if lines L and P intersect at the point (a,b).

$D=$ the sum of the values of the intercepts of both lines. That is, if L and P have intercepts $(r,0),(0,s),(t,0)$ and $(0,w)$ then $D=r+s+t+w$.

ALGEBRA II TEAM Question #11 No Calculator

Refer to the circle with equation $x^2 + y^2 = 9$ for question #11.



$A =$ the distance between the points on the circle with coordinates $(1, a)$ and $(1, b)$.

$B =$ the area of the quadrilateral whose four vertices are the x- and y-intercepts of the circle,

$C =$ the probability that a point randomly chosen from the interior of the circle is also within the triangle with vertices $(-3,0), (3,0)$ and $(0,3)$.

$D =$ the number of steps a bug must take to complete one revolution around the circle. The bug begins on the point (3,0) and moves clockwise a distance of π units along the circle for each step that he takes. The first position at (3,0) is not counted as a step and the last step, at or before (3,0) is counted. The bug will not go past (3,0) to complete its final step.

ALGEBRA II TEAM Question #12 No Calculator

Use $a\#b = 2ab - b$ for question #12.

$A = (1\#(2\#3))$

$B = \left(4\#\frac{1}{4}\right) - \left(3\#\frac{1}{3}\right)$

$C =$ the value of x such that $2\#x = 4\#1$.

$D =$ the sum of the real values of x such that $\frac{1}{1\#x}$ is undefined.

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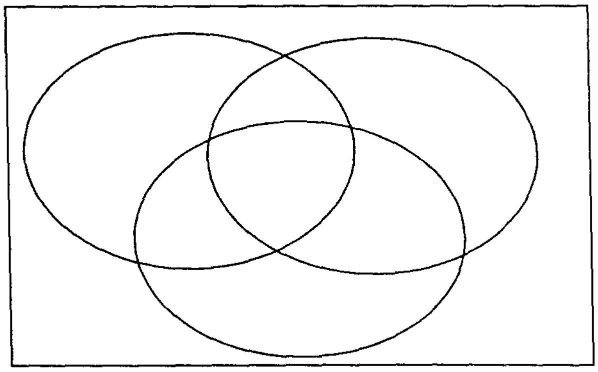
ALGEBRA II TEAM Question #13 No Calculator

In a classroom, there are 22 students.
6 students have red shirts, 10 students have black pants, and 10 students are wearing white shoes. 3 students are wearing red shirts and white shoes; 6 students are wearing black pants and white shoes; 1 student is wearing a red shirt but not black pants nor white shoes;
1 student is wearing all three (red shirt, black pants, white shoes).



$A =$ the number of students who are wearing a red shirt and black pants.

$B =$ the number of students not wearing white shoes nor black pants.

$C =$ the number of students wearing a red shirt or black pants.

$D =$ the number of students not wearing a red shirt, nor black pants, nor white shoes.

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ALGEBRA II TEAM Question #14 No Calculator

For this question, use the functions $f(x+1) = x^2 + 3x$ and $g(x) = \dfrac{x+2}{x-4}$.

$A =$ the constant term of the function $f(x)$.

$B =$ the greatest value of x such that $f(x) = 2$.

$C =$ the value of $f(k)$ given that k is the x-intercept of the graph of g.

$$D = f\left(\frac{1}{g(-1)}\right)$$

SOLUTIONS

1. A:f(225)=4 and f(4)= $\sqrt{3}$;

B: $4=\sqrt{1+\sqrt{x}}$, 16=1+$\sqrt{x}$, x=225

C: $\sqrt{1+\sqrt{x-1}}=2$, 3= $\sqrt{x-1}$, x=10.

D: $2=\sqrt{1+\sqrt{\frac{1}{x}}}$, 3= $\sqrt{\frac{1}{x}}$, 9= $\frac{1}{x}$ so $x=\frac{1}{9}$

Answers: $A=\sqrt{3},\ B=225,\ C=10,\ D=\frac{1}{9}$

2. a=2i and b=3i.

$A=-6,\ B=\frac{2}{3},\ C=5i,\ D=25i^2=-25$

3. A: $C(10,2)(x)^8(-2)^2$ has coefficient 45(4)= 180.

B: $(i-1)^{10}=(-2i)^5=-32i^5=-32i$

C: $f(\sqrt{2}+2)=(\sqrt{2})^{10}=2^5=32$

D: $\frac{2^{10}}{(1+i)^{10}}=\frac{2^{10}}{(2i)^5}=\frac{2^5}{i^5}=\frac{32}{i}=-32i$

Answers: A=180, B= -32i, C=32, D= -32i

4. $(x-1)^2-(y-2)^2=4;\ \frac{(x-1)^2}{4}-\frac{(y-2)^2}{4}=1$

A: a=2, b=2 so the transverse has length 4.

B: Slope is 4/4 which is 1.

C: asymptote (y-2)=1(x-1) which gives x-y=-1.

D: $a^2+b^2=c^2$, $4+4=c^2$. So $c=2\sqrt{2}$.

Answers: A=4 B=1 C= -1 D= $2\sqrt{2}$

5. There is now 20(0.10) salt in the solution, which is 2 L.

A: $\frac{2+x}{20+x}=\frac{3}{25}$ so x=5/11.

B: adding 5(0.20)=1 L. So percent is 3 liters out of 25L=12

C: increase is 5, divided by 20, which is 25%

D: $\frac{2}{20-x}=\frac{1}{4}$ so x=12 L

Answers: A= $\frac{5}{11}$ B=12 C=25 D=12

6. A: The min occurs when |x+5|=3 and this solves to x= -2 or x= -8. Least value is x= -8.
   B: $x^2-2x-15<0$. The graph has roots 5 and -3 and is negative between. The least x is -2.
   C: The domain of the expression is [-3,3] and for x=-3 or 3, the expression=0. For x=2 or -2, the inequality is true, and so x= -2 is least x.
   D: the solution is (-3,5) and the least x is -2.

Answers: A= -8 B= -2 C= -2 D= -2

7. A: factors of 40 from the set are 1, 5, 8. Probability = 3/5
   B: C(5,2)=10. Since 6+8 and 5+8 are the only sums greater than 11, probability=2/10 or 1/10
   C: out of 3 odds the probability(3 or 5)=2/3
   D: C(5,3)=10 and only the least 3 sum to 9. P=1/10

Answers: $A=\frac{3}{5}$, $B=\frac{1}{10}$, $C=\frac{2}{3}$, $D=\frac{1}{10}$

8. f has a double root at 2. g has no roots. h has roots 5, 1.
   A: 2 B: g is always positive. Answer 0. C: g(3)=5, f(5)=9.
   D: Quadratic formula: $\frac{1\pm\sqrt{1-4k}}{2}=1$, $1\pm\sqrt{1-4k}=2, \pm\sqrt{1-4k}=1$ so k=0.

Answers: A=2, B=0, C=9, D=0

9. $A=\sqrt{5+A}$, since A is positive, gives $A^2-A-5=0,\ A=\frac{1+\sqrt{21}}{2}$.
   $B=\frac{2}{1+B}$ solves to B=1 or B= -2. Since the expression is positive, B=1.
   C: $10=\sqrt{x-10}$ and $100=x-10$ so C=110.
   D: Add the two preceding terms. 1,1,2,3,5,8,13,21,34,55,89,144. Answer 144.

Answers: A=$\frac{1+\sqrt{21}}{2}$ (positive only!), B=1, C= 110, D= 144

10. A: $\frac{3}{6}=\frac{k}{5}$ (the second is the negative reciprocal of -5/k). A=5/2.
    B: You can either substitute the point into either equation, or get the intersection. u=0.
    C: 3x-6y=6, 3x-y=6 subtracts to -5y=0 and y=0. At y=0, x=2. Sum=2.
    D: L intercepts are 2 and -1. P intercepts are -6 and 2. Sum is -3.

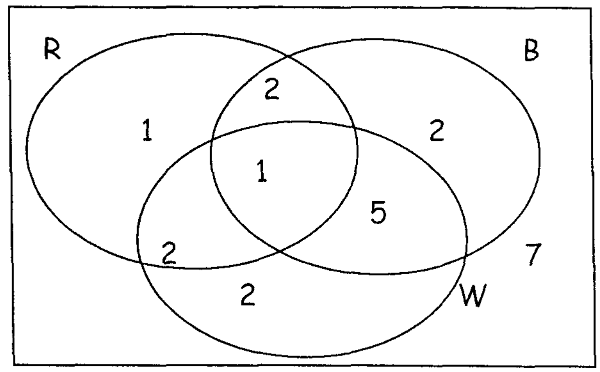
Answers: A=$\frac{5}{2}$, B=0, C=2, D= -3.

11. A: when x=1, y=$2\sqrt{2}$ so distance=$4\sqrt{2}$ B: Each side is $3\sqrt{2}$ so area = 18.
    C: area of the triangle is 1/2(6)(3)=9. Area of the circle is 9π. Probability=$\frac{1}{\pi}$
    D: circumference 6pi/pi= 6.

Answers: A=$4\sqrt{2}$, B=18, C=$\frac{1}{\pi}$, D=6

12. A: 2(2)(3)-3=9, 2(1)(9)-9=9
B: (2-1/4)-(2-1/3)= -1/4+1/3= 1/12
C: 2(2x)-x=7 x=7/3
D: 1#x=0 2x-x=0, x=0

Answers: A=9 B= $\frac{1}{12}$ C= $\frac{7}{3}$ D= 0



13. A: 3 B: 8 C: 13 D: 7

14. A: $(x-1)^2+3(x-1)$ has constant -2

B: $(x-1)^2+3(x-1)=2$; $x^2+x-4=0$

$$x=\frac{-1+\sqrt{17}}{2}$$

C: k= -2, f(-2)=f(-3+1)=9-9=0
D: g(-1)= -5 f(-5)=36-18=18

A: -2 B: 0 C: $x=\frac{-1+\sqrt{17}}{2}$ D: 18