Algebra 1 Team Solutions

1.
   a. Using the slope formula, we find that the slope is $\frac{3}{2}$. Then plug in either point to get the equation $y = \left(\frac{3}{2}\right)x + 4$, therefore the answer is 4.
   b. The slope of the line in the form $Ax + By = C$ is $-\frac{A}{B}$, which in this case is $\frac{3}{5}$
   c. Using the same method as above, the slope of that line is $\frac{4}{7}$, then take the negative of the reciprocal to get the perpendicular slope $\frac{-7}{4}$.
   d. Using elimination, the lines intersect at $(-27, -14)$.

2.
   a. The sum of the angles in a triangle add up to 180. If you add the angle values together and set that equal to 180, x is equal to 32.
   b. The largest angle is 96, the smallest is 12. $96 - 12 = 84$.
   c. Simply plug in the values to the function to get 24.
   d. Simply plug in the values to the function to get 20.

3.
   a. Setting a system of 2 equations we see that Yared sells 69 strawberry pop tarts. S is strawberry and F is hot fudge. S+F=101. 10S+6F=882
   b. Profit = revenue – cost. The revenue for a Hot Fudge is 6$ and the cost is 5$, so his revenue from each tart is 1$, as he sold 32 Hot fudge tarts, he makes 32$
   c. Setting $4400 + 120t = 13545 - 35t$, we get that $t = 59$. $1925 + 59 = 1984$
   d. We make the inequality $120t > 8800$, and the lowest whole number this holds true is 74. $1925 + 74 = 1999$

4.
   a. Setting both to be positive quickly shows that there is no positive solution, so one must be negative. Then setting $n + 12 = -(n - 11)$ gets $n = -\frac{1}{2}$
   b. The two solutions are 6 and $-\frac{32}{3}$, summing them gets $-\frac{14}{3}$
   c. Simply plug in the x values to receive -20. Be careful to make sure all the positive and negative signs are correct
   d. Simply evaluate the equation to get -81

5.
   a. $(6x + 1)(4x - 1)$: $6 + 4 - (-1 + 1) = 10$.
   b. $(3x - 4)(2x + 3)$: $3 + 2 - (-4 + 3) = 6$
   c. $(17x + 4)(x - 3)$: $17 + 1 - (4 - 3) = 17$
   d. $(7x + 3)(5x - 6)$: $7 + 5 - (3 - 6) = 15$

6.

a. 16, he reaches his peak in the middle of his jump, which is half of 4, so when $x = 2$. Plugging 2 into the equation we get 16
b. 4, another way of stating this is to find the second root of the equation (the first being zero) so factoring gets us 4.
c. -8. Using his peak height as one coordinate $(2, 16)$ and $(4, 0)$ as the other, we can use the slope formula to get -8
d. 0, as both the points are on the x axis.

7.

a. Using elimination, we get $x = \frac{8}{7}$
b. Using elimination, we get $x = 1$
c. Using elimination, we get $x = 4$
d. Using elimination, we get $x = 8$

8.

a. Be careful to use correct order of operations. $a = \frac{31}{2}$
b. 12
c. 48
d. -9

9.

a. Be careful to count your zeroes; a=15
b. Be careful with negative exponents; -1
c. 6
d. 2700

10.

a. This simplifies to $13\sqrt{3}$, $13 - 3 = 10$
b. The first ten primes are 2, 3, 5, 7, 11, 13, 17, 19, 23, and 29, which add up to 129
c. We can use s as the small side length of the rectangle. From the information, we can gather $s(s + 10) = 144$. Using the quadratic formula or factoring gets us that $s = 8$. Then the perimeter is $2s + 2(s + 10)$ or $2(8) + 2(18)$ which results in 52
d. We can use s as the small side length of the rectangle. From the information, we can gather $2s + 2(s + 13) = 42$, therefore $s = 4$. Area is $s(s + 13) = 4(17) = 68$

11.

The words are

a. The word is equation- fourth letter is A.
b. The word is number- fourth letter is B.
c. The word is quadratic- fourth letter is D.
d. The word is subtraction- fourth letter is T.

12.

a. The solution is $x = 2,\ y = 12/5$
b. $x = \frac{35}{3}, y = 11$
c. $x = -1, y = 0$
d. $x = -2, y = -5$

13.

a. Plugging in the variables we get $300 = 600a$, so $a = 1/2$
b. First we can divide an x from the top and bottom to get $\frac{15}{x} = 3$, then we can rearrange to get x= 5
c. Simply plug in 15 to get $\frac{2(15)-2}{15+3} = \frac{14}{9}$
d. Make $\frac{2x-2}{x+3} = 6$, then rearrange to get $2x - 2 = 6x + 18$ so $x = -5$

14.

a. Subtracting out the 80 that have neither, 1220 is the total amount that has AC and TV. So using principle inclusion exclusion we make AC+TV-BOTH=1220. Given AC and TV, 920+800-BOTH=1220, so 500 trailers have both TV and AC
b. We set m to be the number of men in the office. So $m + (m + 35) = 51, m = 8$
c. Using Pythagorean theorem, we get $10\sqrt{5}$
d. Using Pythagorean theorem, we get 25 miles. Alternatively, we can see that the two legs are in the ratio of 3:4, so the hypotenuse has a length of 5

Algebra I Team Answer:

	A	B	C	D
1	4	3/5	-7/4	(-27,-14)
2	32	84	24	20
3	69	32	1984	1999
4	-1/2	-14/3	-20	-81
5	10	6	17	15
6	16	4	-8	0
7	8/7	1	4	8
8	31/2	12	48	-9
9	15	-1	6	2700
10	10	129	52	68
11	A	B	D	T
12	(2,12/5)	(35/3,11)	(-1,0)	(-2,-5)
13	½	5	14/9	-5
14	500	8	$10\sqrt{5}$	5