1. $(-1)^{58} + (-1)^{101} = 1 - 1 = \mathbf{0}$**, B**
2. For $46A217$ to be divisible by 9, the sum of the digits need to add up to a multiple of nine. Seven is the only answer that makes the digits do so. **7, C**
3. $2x + 16 = 3x - 4$
   $\Rightarrow x = 20$ **20, A**
4. $6\frac{1}{4}\%$ is 0.0625 as a decimal. This decimal can be represented by 625/10000. We can reduce this fraction by dividing both the numerator and denominator by 625. Doing this the fraction is found to be $\mathbf{\frac{1}{16}}$**, B.**
5. $x = 450 + .2(450)$, where x is the selling price. Evaluating this equation we get that x is **$540, C.**
6. Given the ratio, $2x + 3x + 4x = 180$. Solving this equation we find that x is 20. The smallest angle must then be $2(20) = \mathbf{40}$**, C**
7. The greatest common factor between the two terms of the binomial is $5b$. When this is factored out of each term, we have ,respectively, $3a$ and $-2b^2$ left. Thus the answer is $\mathbf{5b(3a - 2b^2)}$**, E**
8. Given the information we can set up 3 equations [G is for Grant, I is for Ian, and K is for Kevin]:
   $G + I = 300$
   $I + K = 240$
   $G + I + K = 410$
   Subtracting the first equation from the third we find that, Kevin weighs 110 pounds. Substituting this value into the second equation, Chris' weight is determined to be 130 pounds. **130, C**
9. The product of the least common multiple and greatest common factor of two numbers is always equal to the product of the numbers themselves. Thus:
   $48n = (16)(192) \Rightarrow n = \mathbf{64}$**, C**
10. We substitute the values of p and s into the expression given.
    $\frac{6}{\frac{2}{3}} + \frac{4}{\left(\frac{2}{3}\right)^2} = \frac{18}{2} + \frac{4}{\frac{4}{9}} = 9 + 9 = \mathbf{18}$**, E**
11. Given that n% interest is charged for 3 years on a 2500 dollar amount, we can form the following equation: $(3)(n)(2500) = 600$. Solving for n we get .08. This decimal as a percent would be 8. **8, B**
12. Since the lines are perpendicular, line p has a slope that is a negative reciprocal of line m's slope. This would be $-\left(\frac{1}{-\frac{1}{2}}\right) = 2$. Line p passes through (4, 5), so we have the equation: $5 = 2(4) + b$. The y-intercept is -3, so the equation of line p is $\mathbf{y = 2x - 3}$**, D.**

13. This inequality must be solved in two steps since there is an absolute value sign. First you solve the inequality as if there is no absolute value sign. The result is x < 5. Second you negate the left-hand side of the inequality and then solve for x: $-x+2<3 \Rightarrow x > -1$. Thus you get that $-\mathbf{1} < x < 5$, **C.**
14. The powers of 3 and 5 are the same so the equation can be rewritten as $15^m = (3\times 5)^4$. Thus m is **4, A.**
15. $\sqrt[3]{\sqrt[2]{n}} = 2 \Longrightarrow \sqrt[2]{n} = 8 \Longrightarrow n = \mathbf{64}$, **C.**
16. Given that the length is l and the width is w: $l = 4w$ and $2l + 2w = 40$. The first equation can be substituted into the second to get $8w + 2w = 40$. Thus w is 4. If the width is four, then the length [according to equation 1] must be 16. The area is equal to **64, D.**
17. $\frac{a+9}{2} = 6$ and $\frac{5+b}{2} = 3$. Solving theses two equations we get that $a = 3$ and $b = 1$. Thus $a + b =$ **4, A.**
18. First thing to do is to find a common denominator, $\frac{a}{a-b} + \frac{b}{b-a} = \frac{a(b-a)}{(a-b)(b-a)} + \frac{b(a-b)}{(b-a)(a-b)}$ and then you can simplify the answer: $\frac{ab-a^2}{-a^2+2ab-b^2} + \frac{ab-b^2}{-a^2+2ab-b^2} = \frac{2ab-a^2-b^2}{-a^2+2ab-b^2} =$ **1, E.**
19. If a rectangle is folded in half the length is halved but the width remains the same. The side length of the result square is $\sqrt{36} = 6$. This is the original width, but half the original length. So the original perimeter is $2(6) + 2(12) =$ **36, C.**
20. For the value to be the smallest the number in the denominator must be the largest. Thus the answer is $\boldsymbol{\frac{5}{x+1}}$, **D.**
21. The variable x stands for the number of dimes, $.1x + .25(14 - x) = 1.85 \Rightarrow -.15x = -1.65 \Rightarrow x = \mathbf{11}$, **D.**
22. $8(1+2x) + 9(x-3) = 6 \Rightarrow 8 + 16x + 9x - 27 = 6 \Rightarrow 25x = 25 \Rightarrow x =$ **1, A.**
23. You set up an equation:

$$\begin{array}{r} 100x = 38.88 \\ -\ \ 10x = \ \ 3.88 \\ \hline 90x = 35 \end{array}$$

When you solve for x and simplify you get $\frac{7}{18}$. The sum of the numerator and denominator is **25, C.**

24. The circumference of the circle, 24π, is equal to $2\pi r$. Thus r is equal to 12. Now that we have the radius we can substitute it into πr^2, to get $\mathbf{144\pi}$**, C.**
25. We are given that a is positive and so squaring it and adding a constant will not change its sign. However b is negative, and cubing this number and subtracting a number will result in a negative number. Thus the point is in quadrant **IV, D.**

26. The slope is $\frac{4-(-4)}{-3-3} = \frac{8}{-6} = -\frac{\mathbf{4}}{\mathbf{3}}$, **A**

27. Given that $PV = nRT$, solving for P we get $\frac{nRT}{v}$**.** This value square times V is

$\left(\frac{nRT}{V}\right)^2 V = \frac{(\boldsymbol{nRT})^2}{\boldsymbol{V}}$, **B**

28. $\frac{\frac{1}{2}}{\frac{2}{3}} = \left(\frac{1}{2}\right)\left(\frac{3}{2}\right) = \frac{\mathbf{3}}{\mathbf{4}}$, **C.**

29. Looking at the function, we see that $1 + y = 3$. Thus y is **2, B.**

30. Let a and b be the legs of the right triangle and c the hypontenuse.

$$a + b = 13$$

$$\frac{ab}{2} = 20 \Longrightarrow ab = 40$$

$$c^2 = a^2 + b^2$$

We can organize the above information into a quadratic equation: $(a+b)^2 = a^2 + 2ab + b^2$. Substituting what we know, we get $13^2 = c^2 + 2(40) \Rightarrow c^2 = 89 \Rightarrow c = \sqrt{\mathbf{89}}$**,** **A.**