Easy

1. We can simply plug in $x = 7$ for all answer choices and we get

(A) $\frac{6}{7}$ (B) $\frac{6}{8}$ (C) $\frac{6}{6}$ (D) $\frac{7}{6}$ (E) $\frac{8}{6}$

Now, we can see that the smallest is $\frac{6}{8}$. Therefore, the answer is choice $\boxed{\textbf{(B)}\ \frac{6}{x+1}}$

2. The total gallons lost is the number of days times the rate at which the water is lost. 30 days multiplied by 0.5 gallons a day results in 15 gallons of water loss.

We must be careful for what the question is asking. We must find the remaining water, which is simply $200 - 15 = \boxed{\textbf{(C)}\ 185}$.

3. In order to maximize the number, we must choose the smallest two-digit number to subtract from 200. The smallest two-digit integer is 10. Therefore, we just subtract 10 from 200 and double the resulting number. This will give the largest result for that first operation, and doubling it will keep it as the largest number possible.

$$200 - 10 = 190$$

$$190 \times 2 = 380$$

So the answer is $\boxed{\textbf{(D)}\ 380}$

4. This question is simple but we must be careful. We can use the process of elimination to find the largest number.

Tenths digit: All tenths digits are equal, at 9, so we move on to the hundredths digit.

Hundreths digit: A, B, and C all have the same hundreths digit of 7, and it is greater than the hundredths of D or E (which is 0). Therefore, choices D and E are eliminated.

Thousandths digit: B has the largest thousandths digit of the remaining answers (A, B, C), and so it is the correct answer. A has an "invisible" thousandths digit of 0, while C also has a thousdandths digit of 0. Therefore, the correct answer is $\boxed{\textbf{(B)}\ 0.979}$

5. We just need to find the minimum and maximum word lengths and check to see which answer choice satisfies the restrictions. Since there are 60 minutes in an hour, the number of words must be between $(\frac{1}{2} \times 60) \times 150 = 4500$ and $(\frac{3}{4} \times 60) \times 150 = 6750$. Looking at the choices, we find that the only such choice is $\boxed{\textbf{(E)}\ 5650}$.

6. To find the total number of yellow beans in the bowl, we must first find the number of yellow beans in each bag. In bag A, there are 26 jellybeans, and 50% are yellow. That means there are $26 \times 50\% = 26 \times 0.50 = 13$ yellow jelly beans in this bag.

In bag B, there are 28 jellybeans, and 25% are yellow. That means there are $28 \times 25\% = 28 \times 0.25 = 7$ yellow jelly beans in this bag.

In bag C, there are 30 jellybeans, and 20% are yellow. We find that there are $30 \times 20\% = 30 \times 0.20 = 6$ yellow jelly beans in this bag.

Now we find the total number of beans in the bowl. In all three bags, there are $13 + 7 + 6 = 26$ yellow jelly beans in total , and $26 + 28 + 30 = 84$ jelly beans of all types in total.

Now, we find the percentage of total yellow beans to total beans. $\frac{26}{84} = \frac{26}{84} \cdot 100\% = \frac{13}{42} \cdot 100\% = 30.9\%$ of all jellybeans are yellow. Therefore, the correct answer (the closest) is $\boxed{\textbf{(A)}\ 31\%}$

7. First, notice that each number in the numerator is a multiple of 2, and each number in the denominator is a multiple of 3. This suggests that each expression can be factored. Factoring gives:

$$\frac{2(1+2+3+\cdots+17)}{3(1+2+3+\cdots+17)}$$

Since all the material in the parentheses is the same, we see that there exists a common factor in the numerator and the denominator. We then simplify the expression by cancelling the common denominator leaving $\frac{2}{3}$, which is option $\boxed{\textbf{(B)}\frac{2}{3}}$.

8. Let's call the number x. If 5 times a number is 2, then $5x = 2$ Dividing the equation by 5, we get $x = \frac{2}{5}$, and the number is $\frac{2}{5}$.

If the number is $\frac{2}{5}$, then 100 times its reciprocal is the same thing as 100 times $\frac{5}{2}$, which is 250, giving an answer of $\boxed{\text{(D)}250}$.

9. We can just estimate the numbers, and calculate. The reason we are allowed to do this is that the problem cares only about the sign of each value rather then the actual value.

$P \approx -3.5$

$Q \approx -1.1$

$R \approx 0.1$

$S \approx 0.9$

$T \approx 1.5$

For option A, the value of $P - Q = -3.5 - (-1.1) = -3.5 + 1.1 = -2.4$. Thus option A should be the right answer. Let's check the other answers to make sure that all of them are nonnegative.

For option B, $PQ = -3.5 \cdot -1.1 = +3.85$

For option C, $\frac{S}{Q} \cdot P = \frac{0.9}{-1.1} \cdot -3.5 \approx -0.818 \cdot -3.5 \approx +2.836$

For option D, $\frac{R}{PQ} = \frac{0.1}{3.85} \approx +0.026$

For option E, $\frac{S+T}{R} = \frac{0.9+1.5}{0.1} = \frac{2.4}{0.1} = +24$

As we thought, choice A represents a negative number, so the answer is $\boxed{\text{(A) P - Q}}$.

10. Call this month "Month 0". Make a table of the fish that Brent and Gretel have each month.

Month / Brent / Gretel

0 / 4 / 128

1 / 16 / 256

2 / 64 / 512

3 / 256 / 1024

4 / 1024 / 2048

5 / 4096 / 4096

We see that in 5 months they will have the same number of fish, giving an answer of $\boxed{B}$

Solution 2: A more advanced way to solve this would be by using algebra. We let x represent the number of months it takes till they they get the same number of fish. After x months, the number of fish that Brent has is $4 \cdot 4^x$, because each month his fish quadruples. Similarly, Gretel's fish after x months is $128 \cdot 2^x$. Now, we set these two expressions equal and solve for x.

Our equation is $4 \cdot 4^x = 128 \cdot 2^x$. All of these are powers of 2.

After using some laws of exponents, we simplify our equation to $2^{(2x+2)} = 2^{(7+x)}$ Since the bases are the same, we know that the exponents must also be the same to preserve equality.

Thus $2x + 2 = 7 + x$. Isolating the equation for x, we see that $x = 5$. Our final answer is $\boxed{\text{(B) } 5}$.

11. The fraction of students who walk home is just the total students minus the fraction of students that goes on the school bus, automobile, and bike.

$1 - \frac{1}{2} - \frac{1}{4} - \frac{1}{10}$

$\frac{1}{2} - \frac{1}{4} - \frac{1}{10}$

$\frac{1}{4} - \frac{1}{10}$

$\frac{5}{20} - \frac{2}{20}$

$\frac{3}{20}$ of the entire student population. Therefore, the answer is $\boxed{\text{(B) } \frac{3}{20}}$

Medium

1. First we reduce the original price by 20%.

$100\% - 20\% = 80\%$

$10 \times 80\% = 10 \times 0.8$

$10 \times 0.8 = 8$

Now, we find half of this price.

$\frac{8}{2} = 4 = \boxed{\text{(C) } 4.00 \text{ dollars}}$

2. If the participation increases by 50%, then it is the same as the participation being multipled by a factor of $100\% + 50\% = 1 + 0.5 = 1.5$. Now we can just find the population each year.

In 1997, participation will be $800 \cdot 1.5 = 1200$.

In 1998, participation will be $1200 \cdot 1.5 = 1800$

In 1999, participation will be $1800 \cdot 1.5 = 2700$, giving an answer of $\boxed{\text{(E) } 2700}$.

We could have also multiplyed the original population by 1.5^3, since each year the participation is being multiplied by 1.5. This would have led to the same answer.

3. Rather than computing each expression, we try to find a pattern. Taking the first product, we have

$(1 - \frac{1}{2}) = \frac{1}{2}$

$\frac{1}{2} \times 2 = 1$

Looking at the second, we get

$(1 - \frac{1}{3}) = \frac{2}{3}$

$\frac{2}{3} \times 3 = 2$

We seem to be going up by 1.

Just to check,

$1 - \frac{1}{n} = \frac{n-1}{n}$

$\frac{n-1}{n} \times n = n - 1$

Now that we have discovered the pattern, we should find the last term.

$1 - \frac{1}{10} = \frac{9}{10}$

$\frac{9}{10} \times 10 = 9$

Therefore, the answer is the same thing as the sum of all numbers from 1 to 9, which is

$\frac{(9)(9+1)}{2} = 45 = \boxed{\text{(A) } 45}$

4. Adding all of the numbers in the current list gives us $\frac{11 \cdot (11+1)}{2} = 66$ as the current total. Since there are 11 numbers, the current average is $\frac{66}{11} = 6$. We need to take away a number from the total and then divide the result by 10 because there will be only 10 numbers left to give an average of 6.1. We call the number that we want to remove r. We can now set up an equation involving r.

$\frac{66-r}{10} = 6.1$

Multiplying by the equation by 10, we get $66 - r = 61$

$r = 5$

Therefore, the answer is $\boxed{\text{(B) } 5}$

5. Call the set $\{a, b, c, d, e\}$, with $a \leq b \leq c \leq d \leq e$.

Since the median, or middle number, is 5, we have $c = 5$.

Since the mode, or most common number, is 8, we know that at least two numbers must be 8 so $d = e = 8$.

Thus, the set is now $\{a, b, 5, 8, 8\}$. Also, since there is only one mode, a and b are both less than 5 and are distinct numbers.

Since the mean of the set is 5, and there are five numbers in the set, the sum of the numbers in the set is $5 \times 5 = 25$.

Thus, we have $a + b + 5 + 8 + 8 = 25$, which leads to $a + b = 4$

Since a and b are distinct positive integers, they cannot be 2 and 2. Therefore, they must equal 1 and 3.

The smallest number is 1, and the largest number is 8, giving a difference of 7, leading to answer $\boxed{(D)7}$

6. Let's consider each of the options.

A will give a number that is just over 3.

Since x is positive, $3 + x > 3 - x$. Therefore, choice B is eliminated.

C will give a number that is barely over 0, since it is three times a small number. This eliminates C, because A is bigger.

D will give a huge number. $\frac{3}{x}$ will get very, very large in magnitude when x gets close to zero. When we divide by a small number, the result is relatively large in magnitude. Thus, D will be huge, and this eliminates A.

E will give a small number, since you're dividing a tiny number into thirds. This eliminates E, and our final answer is $\boxed{(D)\ 3/x}$.

7. We know that the tank was originally $\frac{1}{8}$ full, and later at $\frac{5}{8}$ full. Therefore, Walter filled $\frac{5}{8} - \frac{1}{8} = \frac{4}{8} = \frac{1}{2}$ of the tank.

Since we know how many gallons it takes to fill half of the tank, we can double that to find the number of gallons the tank holds when it is full. $7.5 \cdot 2 = 15$ so our final answer is $\boxed{\text{(D) } 15}$.

8. Let's try to find a pattern. If we look the first two groups of four terms, we see that

$(1 - 2 - 3 + 4) = 0$

$(5 - 6 - 7 + 8) = 0.$

This is not a coincidence. For each group of four terms, the positive outer two terms always cancel the inner two negative terms. Therefore, we just need to find how many groups of four exist. Since $\frac{1996}{4} = 499$, we know that there are 499 groups. Since the sum of each group is 0, the total sum is $499 \cdot 0 = 0$. Thus, our answer is $\boxed{(C)\ 0}$.

Hard

1. We must first find the unit prices for the two weeks. Last week, each box was $\frac{5}{4} = 1.25$

This week, however, each box is now $\frac{4}{5} = 0.80$

To find the percent decrease, we need to find the difference in the price divided by the original price. Therefore, the percent decrease is $\frac{1.25-0.8}{1.25} \cdot 100\% = \frac{45}{125} \cdot 100\% = 36\%$, which is closest to $\boxed{(B)\ 35}$.

2. If we carefully look at the fractions, we see that the numerator of the first fraction cancels out the denominator of the second fraction, and the numerator of the second fraction cancels out the denominator of the third fraction, and so on.

After the whole expression, the only remaining numbers will be a in the numerator from the last fraction and 2 in the denominator from the first fraction. (The b will cancel with the numerator of the preceeding number.) Therefore, $\frac{a}{2} = 9$, and we find that $a = 18$.

Finding b is not very difficult. We see that in every fraction, the numerator is always one more than the denominator, so $b = a - 1 = 17$. Therefore, the answer is $a + b = 18 + 17 = 35$, giving an answer of $\boxed{(D)\ 35}$

3. We know that we should not try performing the operation 100 times so we look for a pattern.

After 1 press, the calculator displays $\frac{1}{1-5} = -\frac{1}{4}$

After 2 presses, the calculator displays $\frac{1}{1--\frac{1}{4}} = \frac{1}{\frac{5}{4}} = \frac{4}{5}$

After 3 presses, the calculator displays $\frac{1}{1-\frac{4}{5}} = \frac{1}{\frac{1}{5}} = 5$

Aha, this is same as the original number. Therefore, after every three presses, the display will be 5. On press $3 \cdot 33 = 99$, the display will be 5. Therefore, 100 presses results in the same number as 1 press, so our answer is $\boxed{(A)\ -0.25}$.

4. In June, Ana gets $2000 \cdot (1.2) = 2400$

In July, Ana's pay is $2400 \cdot (0.8) = 1920$, giving our answer of $\boxed{\text{(A) 1920 dollars}}$

5. Let x represent the number of employees. The manager initially wanted to add 50 dollars to each employee, but the fund was 5 dollars short. With the same fund, however, he was able to give each employee 45 dollars and still have 95 remaining. Since the fund is the same, we can form an equation involving x.

$50x - 5 = 45x + 95$

Simplifying this equation, we get that $5x = 100$ so $x = 20$. Now, we just need to plug in x to one of the expressions to find the original fund. $50x - 5 = 995$, so our answer is $\boxed{\text{(E) 995 dollars}}$.