Warm Up

A large order of McDonald's fries costs $3.79. In 2014 they cost $1.59.

What was the % increase in the cost over the last 10 years?

$$\left(\frac{3.79-1.59}{1.59}\right)\cdot 100 = 138\%$$

Did the price at least double?

138% increase

YES

100% + 38%

Homework Questions?

Percent of Change Worksheet

Name_____

Period_____

Directions: State whether each percent of change is a percent increase or a percent decrease. Then find the percent of increase or decrease. Round to the nearest whole percent.

1. Original: $100 New: $59
2. Original: 324 people New: 549 people
3. Original: 58 Homes New: 152 Homes
4. Original: 66 Dimes New: 30 Dimes
5. Original: $53 New: $75
6. Original: 15.6 liters New: 11.4 liters
7. Original: $3.78 New: $2.50
8. Original: 231.2 mph New: 236.4 mph

Directions: Find the final price of each item. When there is a discount and sales tax, first compute the discount price and then compute the sales tax and final price.

9. DVD: $219 sales tax: 6.5%
10. jeans: $39.99 discount: 15% sales tax: 4%
11. book: $19.95 discount: 5% sales tax: 5%
12. tickets: $52.50 sales tax: 7%

#9 $219 + 6.5% of 219

6.5% written as a decimal

$219 \cdot 0.065$

$= 14.24$

$219 + 14.24 = 233.24$

$\boxed{\$233.24}$

$\frac{6.5}{100} = \frac{x}{219}$

$(219)\,0.065 = \frac{x}{219}\,(219)$

$(219)(0.065) = x$

#10 $\left(\frac{39.99}{100}\right)(15) = 6.00$

$39.99\,(0.15)$

Cost w/ discount:

$= 39.99 - 6.00$

$= 33.99$

$\frac{33.99}{100}.04 = 1.36$ tax

Total: $33.99 + 1.36$

$= \$35.35$

#11 $19.95

5% discount

5% tax

5% of 19.95

$19.95 \cdot 0.05 = 1.00$

Discount Price:

$19.95 - 1.00 = \$18.95$

Add 5% tax to discounted price:

$\frac{5}{100} = \frac{x}{18.95}$

$18.95\,(0.05) = 0.95$

$18.95 + 0.95 = \$19.90$

Solve each problem.

1) In February Roger spent 44 hours watching Netflix. In March he only spent 25.52 hours watching. What was the percent decrease in the amount of time he spent watching?

2) At a restaurant the bill came to $54.00. If you leave $61.56, what percent tip is that?

3) A library normally collected $56.00 in fees a month. But in March they collected $84.00. What is the percent increase in the number of fees collected in March?

4) A pole was supposed to be 14 meters long, but it was accidentally made 21 meters long. The pole is _____ percent longer than it needs to be.

5) The price for internet on a phone was $10.00 a month, but starting in November the price will be $13.20 a month. This is a _____% increase.

6) Last year a fishing license cost $59.00. This year the license will cost $44.84. This is a ____ percent decrease.

7) A store sold 13.00 dollars worth of gift cards in October. The next month the goal was to sell $17.16 worth of gift cards. This is an increase of _____ percent.

8) Isabel's family decided to get rid of their cable TV. Originally they were paying $143.00 for the TV, internet and phone, but now they're paying $125.84. What was the percent the bill decreased by?

9) A store normally averaged 102 customers a day. But on the weekends they averaged 75.48 customers a day. What is the percent decrease in the number of customers?

10) Normally a game costs $33.00. But the new special edition version is going to be $39.60. This is an increase of _____ percent.

Answers

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

1-10	90	80	70	60	50	40	30	20	10	0

Investigation 3

Growth Factors and Growth Rates

In Investigation 2, you studied exponential growth of plants, mold, and a snake population. You used a whole-number growth factor and the starting value to write an equation and make predictions. In this Investigation, you will study exponential growth with fractional growth factors.

3.1 Reproducing Rabbits

Fractional Growth Patterns

In 1859, English settlers introduced a small number of rabbits to Australia. The rabbits had no natural predators in Australia, so they reproduced rapidly and ate grasses intended for sheep and cattle.

Did You Know?

In the mid-1990s, there were more than 300 million rabbits in Australia. The damage they caused cost Australian agriculture $600 million per year. In 1995, a deadly rabbit disease was deliberately spread, reducing the rabbit population by about half. However, because rabbits are developing immunity to the disease, the effects of this measure may not last.

Problem 3.1

Suppose biologists had counted the rabbits in Australia in the years after English settlers introduced them. The biologists might have collected data like those shown in the table.

Round Growth Factor to 10th place.

A The table shows the rabbit population growing exponentially.

Growth of Rabbit Population

Time (yr)	Population
0	100
1	180
2	325
3	583
4	1,050

1. What is the growth factor? Explain how you found your answer.
2. Assume this growth pattern continued. Write an equation for the rabbit population p for any year n after the biologists first counted the rabbits. Explain what the numbers in your equation represent.
3. How many rabbits will there be after 10 years? How many will there be after 25 years? After 50 years?
4. In how many years will the rabbit population exceed one million?

B Suppose that, during a different time period, biologists could predict the rabbit population using the equation $p = 15(1.2)^n$, where p is the population in millions, and n is the number of years.

1. What is the growth factor?
2. What was the initial population?
3. In how many years will the initial population double?
4. What will the population be after 3 years? After how many more years will the population at 3 years double?
5. What will the population be after 10 years? After how many more years will the population at 10 years double?
6. How do the doubling times for parts (3)–(5) compare? Do you think the doubling time will be the same for this relationship no matter where you start the count? Explain your reasoning.

Homework

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