

Sales, Distribution, and Marketing Operations (52.1801) T-Chart

Compare and order real numbers in the field of Marketing and Business

Compare and/or order any real numbers: rational and irrational

Program Task: Compare and order real numbers in the field of Marketing and Business.

PA Core Standard: CC.2.1.HS.F.2

Program Associated Vocabulary:
PERCENTAGES, FRACTIONS, DECIMALS, DISCOUNTS, CONVERSIONS

Description: Compare and/or order any real numbers: rational and irrational.

Math Associated Vocabulary:
REAL NUMBER, RATIONAL NUMBER, IRRATIONAL NUMBER, DECIMAL, FRACTION, SQUARE ROOT

Program Formulas and Procedures:
In the field of Marketing and Business Education, students work with numbers in a variety of different formats. It is important for students to be able to differentiate the values of numbers and use them in daily applications in the field.

Formulas and Procedures:
It is relatively simple to compare numbers when they are in the same form. For example 0.15 is smaller than 0.25. The numbers are both in decimal form so are easily comparable. It becomes more difficult to compare numbers that are either in different forms, such as a fraction to a decimal, or in fractional form with different denominators, such as $\frac{3}{5}$ and $\frac{5}{9}$.

Example: Review the list of numbers, convert the numbers to their decimal equivalent, and place them in order from least to greatest:

1/8	35%	40%	5%
.105	75%	65%	18%
.085	.005	10%	1/3
93%	50%	1/4	.675

The easiest way to compare numbers that are in different forms is to convert each number to its decimal form.

Example: Which of the following numbers is largest?

$\frac{6}{25}$ $\frac{3}{14}$ 0.2

- Convert each number to its decimal equivalent:
0.24 0.2142857... 0.2
- Compare the digits in the tenth place, if they are the same move to the hundredths place, and so on until the order can be determined.

For instance, we cannot round to the nearest tenth, because it would give us the same value of .2 for all of the numbers.

Rounding to the nearest hundredth would make the numbers:

0.24 0.21 0.2

- Add zeroes to make all numbers have the same number of digits after the decimal.

0.24 0.21 0.20

For comparative purposes, it is important to add a zero so that the numbers $\frac{20}{100}$, $\frac{21}{100}$, and $\frac{24}{100}$ can be compared.

Since $\frac{24}{100}$ is larger than $\frac{21}{100}$ and $\frac{20}{100}$, 0.24 ($\frac{6}{25}$) is the largest number.

Solution:

1.	.005	.005
2.	.05	5%
3.	.10	10%
4.	.105	.105
5.	.125	1/8
6.	.18	18%
7.	.25	1/4
8.	.3333	1/3
9.	.35	35%
10.	.40	40%
11.	.50	50%
12.	.65	65%
13.	.675	.675
14.	.75	75%
15.	.85	.85
16.	.93	93%

Instructor's Script - Comparing and Contrasting

The activity displayed on the marketing side of the T-Chart on page one is a great way to engage students in comparing and ordering real numbers. Instructors who want to integrate this content should keep in mind that it is important to use numbers that are applicable to their trade area since some trades only use rational numbers.

Common Mistakes Made By Students

Comparing decimals: Decimals are easier to compare if the number of digits after the decimal point is the same. For instance, students often think that 0.6 is less than 0.34 because 6 is less than 34. A zero must be added to the 6 to make the number .60 so that the student can compare 0.60 and 0.34

Comparing fractions: Fractions can be compared when they have a **common denominator**. For instance, 5/16 inches and 3/8 inches are two measurements on a ruler. In order to compare the two fractions, they must have a common denominator, 16. 3/8 is larger than 5/16.

$$\frac{3}{8} = \frac{\quad}{16} \qquad \frac{3 \times 2}{8 \times 2} = \frac{6}{16}$$

CTE Instructor's Extended Discussion

Having a solid understanding of numbers in various forms is an essential tool for anyone in the field of Marketing and Business. A salesperson will use percentages to sell products to customers and managers will use percentages to determine goals for the store. These could be related to percentage increases, mark-up goals, commissions, payroll percentage to sales goals, and profit margins to name a few. Having the ability to differentiate between fractions, decimals and percentages is an important skill for entry level positions all the way up to chief executive officers in the field of Marketing and Business. This skill helps people in the field analyze information in a variety of different formats and provides them with the flexibility to explain and display data in a variety of different formats.

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Problems	Career and Technical Math Concepts	Solutions
1. Put the numbers in order from least to greatest: .50, $\frac{6}{7}$, 25%, .005, $\frac{2}{3}$		
2. Put the numbers in order from least to greatest: $\frac{3}{8}$, $\frac{7}{10}$, .23, 17%, $\frac{2}{5}$		
3. Put the numbers in order from least to greatest: 47%, $\frac{1}{5}$, $\frac{8}{9}$, 31%, .672		
Problems	Related, Generic Math Concepts	Solutions
4. Which of the following measurements is longest? $2\frac{1}{2}$ inches, $2\frac{3}{8}$ inches, $2\frac{7}{16}$ inches		
5. Order the following measurements from least to greatest: $\sqrt{7}$ feet, $2\frac{1}{2}$ feet, 2.6 feet		
6. Which of the following measurements is largest? 2π cm., $\sqrt{41}$ cm., 6.25 cm.		
Problems	PA Core Math Look	Solutions
7. Order the following numbers from least to greatest: 2.4, $\sqrt{5}$, $2\frac{7}{8}$		
8. Order the following numbers from largest to smallest: 0.02, 0.223, 0.24, 0.243		
9. Order the following numbers from least to greatest: $\sqrt{10}$, π , $3\frac{1}{5}$, 3.25		

Problems	Career and Technical Math Concepts	Solutions
1. Put the numbers in order from least to greatest: .50, 6/7, 25%, .005, 2/3	List numbers: Rewrite as decimals: List in order from least to greatest:	.50 6/7 25% .005 2/3 .500 .850 .250 .005 .666... .005, 25%, .50, 2/3, 6/7
2. Put the numbers in order from least to greatest: 3/8, 7/10, .23, 17%, 2/5	List numbers: Rewrite as decimals: List in order from least to greatest:	3/8 7/10 .23 17% 2/5 .375 .70 .23 .17 .40 17%, .23, 3/8, 2/5, 7/10
3. Put the numbers in order from least to greatest: 47%, 1/5, 8/9, 31%, .672	List numbers: Rewrite as decimals: List in order from least to greatest:	47% 1/5 8/9 31% .672 .470 .200 .888... .310 .672 1/5, 31%, 47%, .672, 8/9
Problems	Related, Generic Math Concepts	Solutions
4. Which of the following measurements is longest? 2 1/2 inches, 2 3/8 inches, 2 7/16 inches	List numbers: Rewrite as decimals: Round to the hundredth: 2 1/2 inches is longest	2 1/2 inches 2 3/8 inches 2 7/16 inches 2.5 inches 2.375 inches 2.4375 inches 2.50 2.38 2.44
5. Order the following measurements from least to greatest: √7 feet, 2 1/2 feet, 2.6 feet	List numbers: Rewrite as a decimal: Round to the nearest hundredth: Least to greatest:	√7 ft. 2 1/2 ft. 2.6 ft. 2.646 2.5 2.6 2.65 2.50 2.60 2 1/2 ft., 2.6 ft., √7 ft.
6. Which of the following measurements is largest? 2π cm., √41 cm., 6.25 cm.	2π cm. √41 cm. 6.25 cm. 6.28 cm. 6.40 cm. 6.25 cm. √41 cm. is the largest measurement.	
Problems	PA Core Math Look	Solutions
7. Order the following numbers from least to greatest: 2.4, √5, 2 7/8	List numbers: Rewrite as a decimal: Round to nearest tenth: Least to greatest:	2.4 √5 2 7/8 2.4 2.2360... 2.875 2.4 2.2 2.9 √5, 2.4, 2 7/8
8. Order the following numbers from largest to smallest: 0.02, 0.223, 0.24, 0.243	Convert to thousandths: Order the converted numbers from largest to smallest: Place final answer with numbers in original form:	0.020, 0.223, 0.240, 0.243 0.243, 0.240, 0.223, 0.020 0.243, 0.24, 0.223, 0.02
9. Order the following numbers from least to greatest: √10, π, 3 1/5, 3.25	List numbers: Rewrite as a decimal: Round to the hundredth: Least to greatest:	√10 π 3 1/5 3.25 3.16228... 3.14286... 3.2 3.25 3.16 3.14 3.20 3.25 π, √10, 3 1/5, 3.25