Chapter 7  The Metric System of Measurement

( How many meters in a )

kilo _______  hecto _______  deca _______  ==>  ___________

( A meter has )
deci _______  centi _______  milli _______

<table>
<thead>
<tr>
<th>kilo</th>
<th>hecto</th>
<th>deca</th>
<th>base-unit</th>
<th>deci</th>
<th>centi</th>
<th>milli</th>
</tr>
</thead>
<tbody>
<tr>
<td>$10^3$</td>
<td>$10^2$</td>
<td>$10^1$</td>
<td>1</td>
<td>$10^{-1}$</td>
<td>$10^{-2}$</td>
<td>$10^{-3}$</td>
</tr>
<tr>
<td>1000</td>
<td>100</td>
<td>10</td>
<td>1</td>
<td>1/10</td>
<td>1/100</td>
<td>1/1000</td>
</tr>
</tbody>
</table>

distance: meter
examples:

A man walks 300 steps if each step is 1 meter long, then how many kilometers has he walked?

A piece of paper is 0.32 meters long. How many centimeters is this?

mass(weight): gram: 1 x 1 x 1 x cm\(^3\) (mass, weight of water)
examples:

an object weighs 200 g. How many decigrams is this? _________

A person weighs in at 100 kg. How many grams is this? ________

capacity(volume): liter (10x10x10cm\(^3\))
examples:

A mad scientists requires 32 mg of brain fluid. How many grams is this? ________

23 liters of gas is equal to how many milliliters of gas? ________________
Convert from one unit to the other:
See notes from class

ratio: comparison of two quantities with the same units – can be written as a fraction, with a colon, in words

ex. If Joe runs three miles and Ralph runs two miles then write the ratio the distance Joe ran to the distance Ralph ran.

ex. Kim recipe calls for 3oz of butter while Betty’s calls for 4 oz. of butter – write the ratio of the amount of butter in Kim’s recipe to the amount of butter in Betty’s recipe.

ex. Six out of 30 students failed the exam – write a ratio of the students that passed the exam to the students that took the exam

ex. This last exam 20 students made an A or a B. The rest made below a B. Write a ratio of the students that made an A or a B to the total number of students.

ex. The cost of building a walkway was $200 for labor and $400 for material. Find the ratio of the cost of material to the cost of labor.

ex. A baseball team won 120 games and lost 40 games. Write a ratio of the games won to the total number of games played.
rate: comparison of two quantities with different units

ex. a car is driven for 210 miles on 15 gallons. Write the rate of miles to gallons (miles per gallon).

ex. You earn $42 for working 7 hours. Write a rate of the amount you earn per hour.

ex. If the rate of boys to girls in the classroom is 2 to 3, then a classroom with 12 boys consists of how many girls?

ex. The rate of accidents in a workplace to the number of days is 2 to 11, then in a period of 121 days you would have how many accidents?

Unit Rate: is when the denominator is equal to 1.

ex. It costs $3.36 per 15 oz. Write the rate as a unit rate.

ex. A man paid $45 for 3 shirts. Write as a unit rate.

ex. A car is driven 240 miles on 12 gallons. Write as a unit rate.

ex. You earn $300 for working 60 hours. Write as a unit rate.

ex. A recipe asks for 5 tablespoons of sugar to 2 cups of flour. Write as a rate.
US System of measurement:

See page 431 for more common measurements

Length, mass, volume

\[ 1 \text{ ft} = \underline{\phantom{0}} \text{ in.} \implies 48 \text{ in} = \underline{\phantom{0}} \text{ ft.} \]

\[ 1 \text{ lb.} = \underline{\phantom{0}} \text{ oz.} \quad 5 \text{ lbs} = \underline{\phantom{0}} \text{ oz.} \]

\[ 1 \text{ cup} = \underline{\phantom{0}} \text{ oz.} \quad 1 \text{ pint} = 2 \text{ cups} \implies 3 \text{ pints} = \underline{\phantom{0}} \text{ oz} \]

Area: units of are (surface of a region):

\[ 1 \text{ ft}^2 = \underline{\phantom{0}} \text{ in}^2 \quad 1 \text{ acre} = 43560 \text{ ft}^2 \]

\[ 1 \text{ mi}^2 = 640 \text{ acres} \]

Dimensional Analysis: converting from one unit to another.

Find the number of gallons of water in a fish tank that is 36 in. long, 24 in. wide and is filled to a depth of 16 in. Use the fact that 1 gallon = 231 in\(^3\)

More examples:

1. convert:

\[ 2 \frac{1}{2} \text{ cups} = \underline{\phantom{0}} \text{ oz.} \quad 14 \text{ ft} = \underline{\phantom{0}} \text{ yards} \]

\[ 1 \frac{1}{2} \text{ miles} = \underline{\phantom{0}} \text{ yards} \quad 36 \text{ ft}^2 = \underline{\phantom{0}} \text{ yards}^2 \]

\[ 3 \text{ ft}^2 = \underline{\phantom{0}} \text{ in}^2 \quad 30 \text{ lbs} = \underline{\phantom{0}} \text{ oz} \]

\[ 1 \text{ day} = \underline{\phantom{0}} \text{ seconds} \]
2. Use the conversions on page 435 to answer the following questions.

100 yards = ________ meters

If you weigh 140 lbs, then how many kilograms is that? ________

If you are traveling at 100 km/h does that break the 60 mph speed limit? __________

Gasoline costs 35.8 cents per liter. How much is that per gallon?

Proportion: the equality of two ratios or rates

We write \( \frac{a}{b} \) and \( \frac{c}{d} \) are equal ratios, then \( \frac{a}{b} = \frac{c}{d} \)

ex. \( \frac{2}{5} = \frac{14}{35} \)

1\text{st}, 2\text{nd}, 3\text{rd}, 4\text{th} terms: first and fourth are called the extremes, 2\text{nd} and 3\text{rd} are called the means

Note: in any proportion, the product of the means = the product of the extremes

ex. Solve for x.

\[
\frac{x}{2} = \frac{x+1}{3} \rightarrow __________
\]

Solve for n. \( \frac{3}{n} = \frac{25}{13} \rightarrow __________

Solve for r. \( \frac{r-2}{5} = \frac{r+3}{2} \)
More Examples:

1. solve for $t$. \( \frac{t^2 + 3}{3t + 1} = \frac{t}{3} \)

2. A $2500 investment earns $225 in interest. What investment would earn $350 over the same time period?

3. If a person loses 8 lbs in 6 months, then how long would it take him to lose 20 lbs.

4. The dosage for a medicine is 2 mg. for every 80 lbs of body weight. How many milligrams of this medication are required for a person that weighs 220 lbs?

5. It takes 12 gallons to drive 200 miles, how many gallons will take to complete a 500 mile trip?

6. A steak costs $12.60 for 3 lbs. At this rate, how much does an 8 lb. steak cost?
Direct and Inverse Variation.

Direct Variation

\[ y = kx \] describes a direct relationship between \( x \) and \( y \). \( k \) is a constant of variation (constant of proportionality). We say \( y \) varies directly with (as) \( x \).

ex. Find the constant of variation if \( y \) varies directly as \( x \) and \( y = 10 \) when \( x = 25 \).

ex. Given that \( R \) varies directly as \( T \), and \( R = 20 \) when \( T = 15 \), find \( R \), when \( T = 45 \).

Notice that

\[
\frac{y_1}{x_1} = \frac{k_1 \cdot x_1}{k_2 \cdot x_2}
\]

if \( k_1 = k_2 \), then

\[
\frac{y_1}{x_1} = \frac{y_2}{x_2}.
\]

\[ R = k \cdot x \] \( R \) varies ________________ as \( x \)

If \( R = 12 \) when \( x \) is 2, then find \( R \) when \( x = 5 \). \( R \) varies ________________ as \( x \)

ex. The number of words typed is directly proportional (varies directly) to the time spent typing. A typist can type 260 words in 4 minutes. Find the number of words typed in 15 minutes.

ex. The distance an object falls is directly proportional to the square of the time (\( t \)) of the fall. If an object falls a distance of 8 ft. in 0.5 second, how far will the object fall in 5 seconds?
Inversely Variation (Varies inversely – inversely proportional)

\[ R = \frac{k}{x} \rightarrow R \text{ varies } \underline{\text{__________}} \text{ as } x \]

If \( R = 4 \) when \( x = 1/2 \), then find \( R \) when \( x = 5/2 \)

ex. If \( y \) varies directly as \( x^2 \) and \( y = 12 \) when \( x = 2 \), then find \( y \) when \( x = 3 \)

ex. Let \( g \) vary inversely as \( d \) and \( g = 200 \) when \( d = 40 \), then find \( g \) when \( d = 10 \)

ex. The time (t) of travel of an automobile trip varies inversely as the speed (v). Traveling at an average speed of 65 mph, a trip took 4 hours. The return trip took 5 hours. Find the average speed of the return trip.

ex. A computer company that produces personal computers has determined that the number of computers it can sell (S) is inversely proportional to the price (P) of the computer. Eighteen hundred computers can be sold if the price is $1800. How many computers can be sold if the price is $1500?
Chapter 8 -

Look at the following pie charts

\[ \frac{5}{8} \quad \frac{3}{20} \quad \frac{20}{100} \]

We write 0.20 and read it as ____________________ as a fraction it’s ________
When expressed in this form with 100 in the denominator, we as also call it a percent ____________

Decimal to Percent ( multiply by 100 )

Ex. Write .42 as a percent ➔ ____________ Write 0.03 as a percent ➔ ____________
Writing 0.1 as a percent ➔ ____________ Write 3/5 as a percent ➔ ____________

Percent to a fraction:

ex Replace % symbol with 1/100 and multiply. --- reduce fraction

\[ 42 \% = \frac{42}{100} \quad 24 \% = \frac{24}{100} \]
\[ 4 \% = \frac{4}{100} \quad 2 \frac{1}{2} \% = \frac{5}{2} \quad \frac{1}{100} \]
What about 3 \frac{1}{4} \% ____________ 4 1/3 % = ____________

Percent to a decimal:

Replace % with 0.01 and multiply --- move decimal place two places to the left

\[ 24 \% = 0.24 \quad 2 \% = 0.02 \quad 0.2 \% = 0.002 \]
\[ 456 \% = 4.56 \]
Fractions to a percent –
Multiply by 100 and attach the % symbol

\[ \frac{1}{4} = \quad \frac{2}{15} = \quad \frac{4}{5} = \]

\[ \frac{3}{13} = \quad \frac{3}{25} = \quad \frac{12}{300} = \]

Decimals to a percent –
Multiply by 100 and attach the % symbol.

\[ 0.24 = \quad 0.04 = \quad 0.1 = \]

\[ 3.104 = \]

Percent Equation - Percent \times Base = amount

ex. What is 12% of 40? 

ex. 20 is what percent of 60? 

ex. 10% of what number is equal to 20?
We can also use proportions to work these problems: \( \text{percent} / 100 = \text{amount} / \text{base} \)

ex. What is 240 % of 24? ________________

ex. 40 is what percent of 90? ________________

ex. 12 % of what number is equal to 4? _________________

47/480 salary of $2240 per month, deductions of 18 % for tax. How much is deducted? __________

54/480 used mobile home was purchased for $18000. This was 64 % of the cost when new. What was the original price (new)

59/480 The diameter of Earth ~ 8000 miles and the diameter of the sun ~ 880000 (actually 870000) What percent of the Earth’s diameter is the sun’s diameter.

ex. A person receives a 2 % commission on the sale of an item. If his commissions for the month total $1200, then how much did he sell?
ex. A person receives a 5% raise in salary. His new salary is $2400, what was his salary before the increase? ________

Percent Increase and Decrease

ex. 3/485 Find the percent increase in the number of women at four-year colleges from 1983 to 1999

Number of women (in millions)

<table>
<thead>
<tr>
<th></th>
<th>1983</th>
<th>1993</th>
<th>2003</th>
</tr>
</thead>
</table>

ex. 8/485 A family reduced its normal monthly food bill of $320 by $50. What percent decrease does this represent?

ex. 13/486 It is estimated that the value of a new car is reduced 30% after 1 year of ownership. Find the value of a $21,900 new car after 1 year.
Markup (percent increase)

\[ M = \text{Markup}, \quad S = \text{selling price}, \quad C = \text{cost}, \quad r = \text{markup rate} \]

\[ M = S - C, \quad S = C + M, \quad M = rC \]

ex. An outboard motor costing $650 has a markup rate of 45%. Find the markup and the selling price.

ex. A set of golf clubs cost $360 and are sold for $630. Find the markup rate.

ex. An outfit sells for $200 after a 20% markup. What was the cost of the outfit?

Markdown – percent decrease – discount

\[ M = \text{discount markdown}, \quad S = \text{sale price}, \quad R = \text{regular price}, \quad r = \text{discount rate} \]

\[ M = R - S, \quad M = r \cdot R, \quad S = R - rR \]

ex. A suit with a regular price of $179 is on sale for $119. Find the markdown.

ex. A stereo set with a regular price of $495 is on sale for $380. Find the markdown rate. Round to the nearest tenth of a percent.
ex. A ring with a regular price of $600 is on sale for 40% off the regular price. Find the sale price.

ex. 22/492 A battery with a discount price (sale price) is on sale for 22% off the regular price. Find the regular price.

Simple Interest:
I = Prt, I = simple interest earned, P = principal, r = annual simple interest rate, t = time (in years)

When you borrow money a fee is charged (an interest). When we calculate the interest with $I = Prt$, we call it a simple interest. There are other ways to calculate an interest.
Need: $M = P + I$, M is the maturity value, P = principal, I = interest
1. If \( y \) is directly proportional to \( d \), then find the proportion constant if \( y = 20 \) when \( d = 7 \).

2. \( A \) varies inversely as \( r^2 \). If \( A = 24 \), when \( r = 2 \), then find \( A \) when \( r = 5 \).

3. Change to a percent.
   - \( 0.3 = \) ____________
   - \( \frac{3}{4} = \) ____________
   - \( 2 \frac{1}{2} = \) ____________
   - \( 1.03 = \) ____________

4. Change to a decimal.
   a) \( 3 \frac{1}{2} \% = \) ____________
   - \( 200 \% = \) _______
   - \( 0.001 \% = \) _______

5. Change to a fraction.
   - \( 2.1 \% = \) ____________
   - \( 4 \frac{1}{6} \% = \) ____________

6. \( 6 \% + 0.2 + 3/5 = \) ____________ as a percent
1. Find 200 % of 82. \[ \text{________________} \]

2. George earned $2000 per month during the 2000 year. He received a 10 % raise. What is his new monthly salary ?

3. Ali spends $300 on food, $500 on bills, $150 on other essentials. The remaining amount of her $1000 budget is spent on pleasure.
   a) How much is spent on pleasure stuff ? \[ \text{____________} \]
   b) What percent of the budget is spent on pleasure stuff ? \[ \text{____________} \]

4. A class consists of 25 students. One fifth of the students missed class on Friday. What percent of the class was present in class ?

5. An item sells for $100. The price is reduced by 20 %. It does not sell. An additional 10 % is taken off the reduced price.
   What is the final price ? \[ \text{____________} \]

   What is the actual percent that the item has been reduced from the original price ? \[ \text{____________} \]
1. An object costs $200. The storeowner has a markup of 10% of the cost. What is the selling price?

2. An object that sells for $140 has a markup of 20% of the cost. What is the cost of the object? (price before the markup)

3. An item has an original price of $400. It sold at a markdown of 5% off the original price. What is the new selling price?

4. A TV is being sold at a 25% off the original price. If it now sells for $225, what was the original selling price.

5. \( I = Prt \) represents the interest on a simple interest loan.

   You borrow $1200 at 12% simple interest for 12 months. How much will you owe at the end of 12 months?
Geometry:
point – “dot” – no width or length

line (l) – infinite length in both directions – determined by two points => AB
ray – infinite length in one direction - has a vertex (endpoint) =>

line segment – part of a line – determined by two endpoints =>

plane – flat surface – has length and width – infinite direction --

plane figure – any figure that lies on the plane

intersecting lines –

Parallel lines –

angle – A, BAC, or variable

degrees – “1/360th of a circle”

right angle – angle with a measure of 90°

perpendicular lines – lines that intersect at right angles

Complementary – angles whose measures add up to _______

Supplementary – angles whose measures add up to _______

Acute angle – an angle with a measure ________________

straight angle - an angle with a measure equal to __________

Obtuse angle – an angle with a measure __________

adjacent angles – two angles are said to be adjacent if they share a common side

vertical angles - angles that are on opposite sides of the intersection of two lines
Transversal line – line that intersects two other lines at different points

ex.

Alternate interior – Alternate exterior – corresponding angles -

Properties –
1) Vertical angles are equal
2) Alternate interior angles are equal (in measure )
3) alternate exterior angles are equal
4) corresponding angles are equal
Triangles – three non parallel lines intersect

interior angles --
Property –
the sum of the measures of the interior angles of a triangle is 180°.

Ex. See page 519

1) acute, obtuse, right, straight,

2) complementary, supplementary

3) segment

More examples

18) 

22)
Plane geometric figures:

polygon: closed figure formed by the intersection of three or more lines (line segments)
A polygon is a regular polygon if all sides are of equal length, all angles are of equal measure

<table>
<thead>
<tr>
<th># of sides</th>
<th>name of polygon</th>
<th>regular polygon</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>triangle</td>
<td>equilateral triangle</td>
</tr>
<tr>
<td>4</td>
<td>____________________</td>
<td>___________________</td>
</tr>
<tr>
<td>5</td>
<td>____________________</td>
<td>___________________</td>
</tr>
<tr>
<td>6</td>
<td>others: heptagon, octagon, nonagon, decagon</td>
<td></td>
</tr>
</tbody>
</table>

Perimeter: distance around the polygon, Area: area inside the polygon

Triangles:
equilateral : ________________________ isosceles : ________________________________

scalene: _______________________________

Right triangle: one of the angles has measure of __________

Acute triangle: _______________________ Obtuse triangle:

Formulas for
Perimeter: \( a + b + c \)

Area: \( A = \frac{Bh}{2} \) or \( \frac{1}{2}(Bh) \), \( B \) represents the length of the base and \( h \) = height of triangle.

ex. ex.
Rectangle: quadrilateral with four right angles
Perimeter: \( P = a + b + a + b = 2a + 2b \), Area: \( A = ab = \text{length} \times \text{width} \)

Square: a rectangle with all sides of equal length --- a quadrilateral can have sides of equal length and not be a square. What is it called?
Perimeter: \( P = s + s + s + s = 4s \), Area: \( A = s^2 \)

Parallelogram: a quadrilateral with each pair of opposite parallel to each other.
Perimeter: \( a + b + a + b = 2a + 2b \), Area: \( A = Bh \), \( B = \text{base} \)

Trapezoid: a quadrilateral with one pair of opposite sides parallel
Perimeter: usual Area: \( A = \frac{1}{2} \times (B_1 + B_2) \times h \)
Circle:
Perimeter = circumference
\[ C = \pi D, \quad D = \text{diameter}, \]
\( \pi \) is approximately 3.14
\[ C = 2\pi r, \quad r = \text{radius} \]

ex. ex.

Formulas to keep in mind:

<table>
<thead>
<tr>
<th>Figure</th>
<th>Perimeter</th>
<th>area</th>
<th>volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>triangle(a, b, c), ht</td>
<td>a + b + c</td>
<td>( \frac{1}{2} \cdot (\text{base}) \cdot \text{ht} )</td>
<td>**************</td>
</tr>
<tr>
<td>rectangle(a, b, a, b)</td>
<td>2a + 2b</td>
<td>ab</td>
<td>**************</td>
</tr>
<tr>
<td>square(a, a, a, a)</td>
<td>4a</td>
<td>( a^2 = a \cdot a )</td>
<td>**************</td>
</tr>
<tr>
<td>Parallelogram(a, b, a, b), ht</td>
<td>2a + 2b</td>
<td>( \text{ht} \cdot \text{base} )</td>
<td>**************</td>
</tr>
<tr>
<td>Trapezoid (a, b, c, d)ht</td>
<td>a + b + c + d</td>
<td>( \text{ht} \cdot (\text{sum of bases})/2 )</td>
<td>**************</td>
</tr>
<tr>
<td>Circle(r)</td>
<td>2\pi r = \pi D</td>
<td>( \pi r^2 )</td>
<td>**************</td>
</tr>
</tbody>
</table>

Volumes
rectangular solid – box \( \Rightarrow L \cdot W \cdot H \Rightarrow \Rightarrow \ldots \) a cube with side \( s \Rightarrow s^3 \)
sphere – ball \( \Rightarrow \frac{4}{3} \cdot \pi r^3 \)
right circular cylinder \( \Rightarrow \pi r^2 h \Rightarrow \Rightarrow \) right circular cone \( \Rightarrow \frac{1}{3} \cdot \pi r^2 h \)
regular square pyramid \( \Rightarrow \frac{1}{3} \cdot s^2 h \)

Surface Areas: area on the surface of an object
rectangular solid (box), sphere = 4\( \pi r^2 \), right circular cylinder, rt. c. cone, reg. pyramid
Additional Examples:

86/540

94/540

98/540

58/540

59/540

60/540

62/540
1. The distance from the surface of the earth to its center is 6356 km. What is the circumference of the earth? Round to the nearest kilometer.

2. Bias binding is to be sewed around the edge of a rectangular tablecloth measuring 72 inches by 45 inches. If the bias binding comes in packages containing 15 ft of binding, how many packages of bias binding are needed for the tablecloth?

3. The height of a trapezoid is 5 inches. The bases measure 16 inches and 18 inches. Find the area of the trapezoid.

4. You want to paint the walls of your bedroom. Two walls measure 15 ft by 9 ft. and the other two walls measure 12 ft by 9 ft. The paint you wish to purchase costs $19.98 per gallon, and each gallon will cover 400 ft$^2$ of wall. Find the total amount you will spend on paint.
Triangles

Right – triangle and the Pythagorean Thm.

\[ a^2 + b^2 = c^2 \]

This property allows us to find one missing side when two of the other sides of a right triangle are given.

ex. ex.

Similar Triangles: look the same – same shape
- corresponding angles are equal
- ratio of corresponding sides are equal
- the ratio of corresponding hts. are equal to ratio of corresponding sides

Congruent Triangles – same shape and same size
Three types
1) SSS: Two triangles are congruent if the three sides of one triangle equal the corresponding three sides of a second triangle.

2) SAS: Two triangles are congruent if two sides and the included angle of one triangle equal two sides and the included angle of a second triangle

3) ASA: Two triangles are congruent if two angles and the included side of one triangle, equal two angles and the included side of a second triangle.

ex. ex.
Geometric solids: figures in space
Volume and Surface Area

Rectangular solid – all six sides are rectangles

Cube --

Sphere –
Cylinder --

Right circular cone –

Regular pyramid
Things to study for exam V: Include Chapter 7, 8, and up to page 542 of chapter 9

Chapter 7

1. Metric System:
   kilometer, meter, centimeter, millimeter: convert from one to another

2. Metric – to – US system
   Given relationships: 1 inch = 2.54 cm find what 12 inches = ________ cm

3. Dimensional Analysis: A toy car that moves at 12 inches per second travels at how many feet per hour?

4. Ratios and Proportions:

5. Direct Variation and Inverse Variation

Chapter 8:

1. Change from percent – fractions – decimals

2. Use percent equation or proportions to find answer to percent questions.

3. Percent increase (Markup) or decrease (Markdown), simple interest

Chapter 9

1. Basic Terminology: lines, triangles, angles – right, acute, obtuse, isosceles, equilateral, scalene parallel, perpendicular, right angles

2. Given angles or lines – find x

3. Identify polygon

4. Find areas, perimeter
1. Draw two lines that are perpendicular

2. Find the value of $x$ in each of the following cases

   a) 

   b) 

   c) 

   d) 

   e)
Chapter 10

Frequency distributions

#2 – 12 /589

Histogram
23-26/591

35-38 page 592
Mean (arithmetic mean, average) \[ \bar{x} = \frac{\text{sum of all data values}}{\text{number of data values}} \]

Ex. A student takes five exams: 68, 74, 66, 84, 90. Find the mean of the test scores

Ex. I drove my car for 300, 280, 320, 300, 280 with each of the last 5 tank-fulls of gas. What is the mean of these numbers?

Ex. A class consists of 50 students with the following grades:
   10 made an A, 16 made a B, 20 made a C, 3 made a D, and the rest made an F.
   What is the GPA of this class?

The median: the value that separates the data into two equal parts – when written in increasing (or decreasing order)

3, 5, 2, 2, 5, 7, 8 ➔ median:

1, -2, 4, 1, 2, -2, 1, 4 ➔ median:

Find the median of the following set of data:

4 occurs with frequency 12, 0 occurs with frequency 8, and 10 occurs with frequency 5

Mode: the value with the largest frequency – occurs the most often. Must occur more than once
Math 130A – Last Week

Congruent figures:

Similar:

Volume:
Surface Area:

Composite Figures:
1. Find the average weight of a basketball team (starting five) with weights
   
   140, 180, 160, 140, 220

2. What is the mode of the data above

3. Find the mode of

4. Find the median of

5. What is the volume of a room of size
1. Draw two lines that are parallel

2. Draw two lines that are perpendicular

3. Use the following picture to give me a pair of

   a) a pair of vertical angles ➔ ____________
   b) alternating interior angles ➔ ____________

   c) alternating exterior angles ➔ ______________

   d) corresponding angles ➔ ______________

4. Draw an acute angle

5. What is the complement of $40^0$? _______________
6. Find the supplement of $80^\circ$. ______________________

Find $x$ in each of the following cases

1. 

2. 

3.
4.

Part IV – Math 130A – November 5, 2001

Math 130A – Quiz - Name _____________________________, November 5, 2001

1. How many kilograms of fertilizer are required to fertilize 400 trees in an apple orchard if 300 g of fertilizer are used for each tree.

2. A carat is a unit of weight equal to 200 mg. Find the weight in grams of a 10-carat precious stone.

3. An athletic club uses 800 ml of chlorine each day for its swimming pool. How many liters of chlorine are used in a month of 30 days?

4. This last exam 20 students made an A or a B. The rest made below a B. Write a ratio of the students that made an A or a B to the total number of students.

5. The cost of building a walkway was $200 for labor and $400 for material. Find the ratio of the cost of material to the cost of labor.

6. A baseball team won 120 games and lost 40 games. Write a ratio of the games won to the total number of games played.
US units of measurements –

ex. A runner runs 800 yard. How many feet is this?

ex. A tree is found 436 feet from a fence. How far is the tree from the fence in miles?

ex. A person drinks 4 cups of water a day for 7 days. How many oz. of water does this person drink per week?

ex. How many gallons does a car use if 42 quartz were pumped into the gas tank?

ex. How many seconds have you lived when you reach the age of 25?

We can convert between metric units and the US system. --- see page 435 in book

ex. How fast are going if your car odometer reads 80 kmh?

ex. A large container is filled with 42 gallons. Round to the nearest cent the amount that you would pay if its costs $0.50 per liter.

Proportion - the equality of two ratios or rates.

ex. a recipe calls for 3 cups of flour to 2 tablespoons of sugar.

Is this a proportion - \[ \frac{3}{2} = \frac{12}{8} \] ?

Product of the means: \[ \text{Product of the extremes: } \]

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Find the value of \( x \) if each of the following represent proportions.

\[ \frac{2}{5} = \frac{x}{15} \]

\[ \frac{5 + n}{4} = \frac{3}{2} \]

ex.

Math 130B – Quiz, November 7, 2001, Name __________________________

0.1 Homework ___________________ (20, 15, 10)

1. Write as a rate: 240 miles in 4 hours  
   \[ \frac{240}{4} = \]  
   $200 for 10 hours of work  
   \[ \frac{200}{10} = \]

2. If 1 inch = 2.54 cm, then how many feet are there in 254 cm?  
   \[ \frac{254}{12} = \]

3. Convert 8 ft/sec to miles per hour. Assume that 5280 ft = 1 mile.  
   \[ \frac{8 \times 5280}{3600} = \]

4. It costs $15 per sq yard of carpet. How much will it cost to cover 144 sq feet?

5. A man is carrying 8 quarts of water. If each gallon weighs 8 1/3 lbs, then find the weight of the water the man is carrying. Leave answer as a fraction in simplest form (mixed).

6. Solve for \( n \).  
   \[ \frac{n}{5} = \frac{12}{15} \]  
   \( n = \) ____________
\[
\frac{(n - 1)}{3} = \frac{8}{9}
\]

Math 130A

ex. 52, 53, 54

Direct Variation: \( y = kx \)

Inverse Proportion: \( y = \frac{k}{x} \)
1. Label as direct variation, inverse variation, or neither
   a) $y = \frac{k}{x}$ → __________________
   b) $y = k + x$ → __________________
   c) $y = kx$ → __________________

2. Find the constant of variation ($k$) if $y$ varies directly as $x$, and $y = 20$, when $x = 5$. __________

3. Find the constant of variation ($k$) if $y$ varies inversely as $x$, and $y = 2$ when $x = 4$. ______________

4. Given that $T$ varies directly as $S$, and $T = 36$ when $S = 9$, find $T$ when $S = 2$. ______________

5. Given that $T$ varies inversely as $S$, and $T = 4$ when $S = 2$, find $T$ when $S = 4$. ______________
1. Draw a pair of parallel lines

2. Draw a pair of intersecting lines

3. A man receives a commission of 2% of the sales amount. If the total sales for last month were $24300, then what was the amount of his commission?

4. A TV set has a selling price of $450. If it is marked down 15% off of the selling price, then what is its sales price (price after the discount)?

5. A shopkeeper buys a gadget at a cost of $120 and wants to make a profit by marking the price up by 5% (mark-up). What is the selling price?

6. The population in the county rose by 4% over the last five years. If the current population is now 92,000, then what was the population five years ago.