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ADULT LEARNING ACADEMY

PRE-ALGEBRA WORKBOOK

UNIT 3: DECIMAL NUMBERS

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UNIT 3: DECIMAL NUMBERS

LEARNING OBJECTIVES

1. **Conceptualizing Decimals:**
   - ☐ Write and describe decimal numbers to ten-thousandths
   - ☐ Order and compare decimal numbers
   - ☐ Plot decimal numbers on a number line
   - ☐ Round decimal numbers to the correct place value

2. **Operations with Decimal Numbers:**
   - ☐ Add multi-digit decimal numbers, including carrying
   - ☐ Subtract multi-digit decimal numbers, including borrowing
   - ☐ Multiply multi-digit decimal numbers
   - ☐ Divide multi-digit decimal numbers
   - ☐ Multiply and divide decimal numbers by powers of ten
   - ☐ Follow order of operations rules when performing calculations with decimal numbers

3. **Conversions with Fractions:**
   - ☐ Convert Decimals to Fractions
   - ☐ Convert Fractions to Decimals

4. **Word Problems:**
   - ☐ Solve basic word problems using decimal number arithmetic, including those involving area and perimeter, and applications to the healthcare industry

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Pre-Algebra Workbook
UNIT 3 VIDEO & EXERCISE LIST

Topic	Website	Videos	Exercises
Conceptualizing Decimals	www.khanacademy.org	Decimal Place Value	Understanding dec. place value
		Decimal Place Value 2	Decimals on the number line 1
		Comparing Decimals	Decimals on the number line 2
		Decimals on a Number Line	Converting Decimals to Frac. 1
		Points on a Number line	
		Decimals and Fractions	
Adding and Subt. Decimals	www.khanacademy.org	Adding Decimals	Adding Decimals 2
		Subtracting Decimals	Adding Decimals 0.5
		Subtracting Decimals Word Problem	Subtracting Decimals 0.5
			Subtracting Decimals
			Add/Sub Decimals Word Probs.
Multiplying Decimals	www.khanacademy.org	Multiplying Decimals	Multiplying Decimals
		Multiplying Decimals 3	Understanding Moving the decimal
		Multiplying a Decimal by a power of 10	
		Dividing a Decimal by a power of 10	
Dividing Decimals	www.khanacademy.org	Dividing Decimals	Dividing Decimals 0.5
		Dividing Decimals 2.1	Dividing Decimals 1
			Dividing Decimals 2

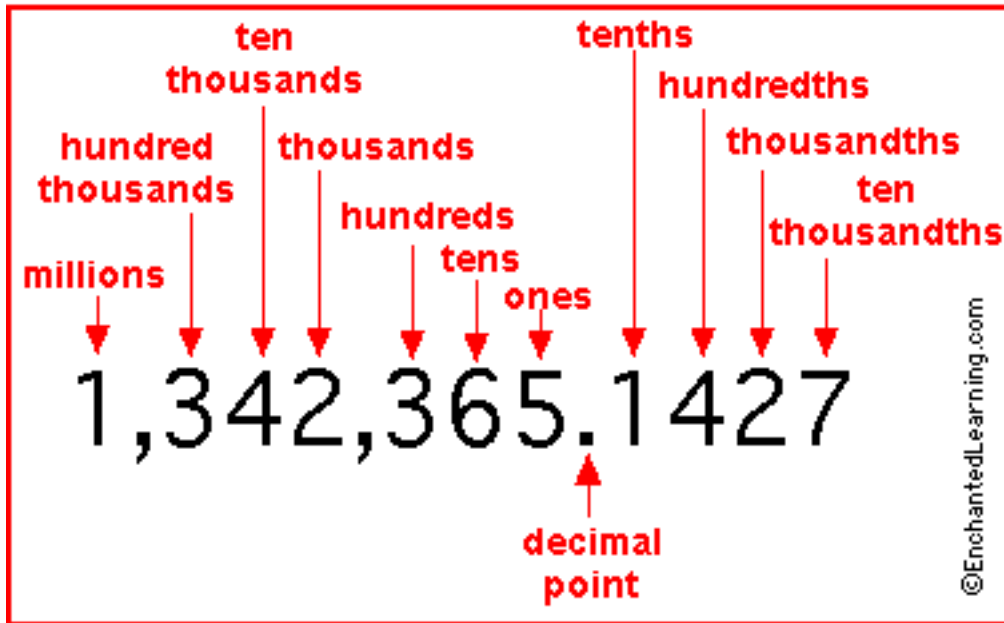| Topic	Website	Videos	Exercises
Converting Fractions to Dec	www.khanacademy.org	Converting Fractions to Decimals	Worksheet: Color the circles
		Converting Fractions to Decimals ex 1	
		Converting Fractions to Decimals ex 2	
Rounding Decimals	www.khanacademy.org	Rounding Decimals	Rounding numbers
		Estimation with Decimals	Estimation with Decimals
Review of Unit 3	www.stlcc.edu	Blackboard Powerpoint	"Unit 3 Review Flashcards"
Compass Practice	http://www.hostos.cuny.edu/oaa/compass/pre-alg_prac3.htm		Decimals

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Place Value Chart including Decimals

Song:
Happy Birthday

You must line up the decimal point,
You must line up the decimal point,
To ADD or SUBTRACT,
You must line up the decimal point!

Adult Learning Academy
Pre-Algebra Workbook
3.2 DECIMAL PLACE VALUE COMPARISON

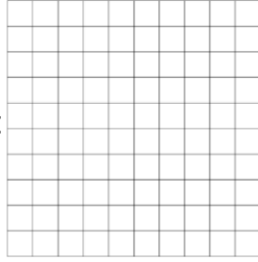Shade the decimal numbers in the grids below. Compare the values of the numbers within each column.

Are these numbers the same or different? If different, which number is the biggest? Smallest?
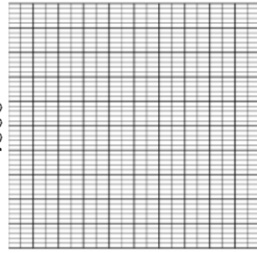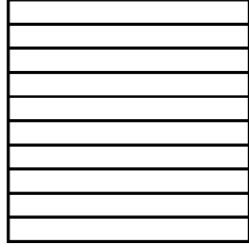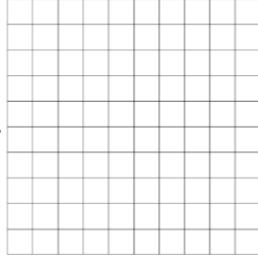
.6
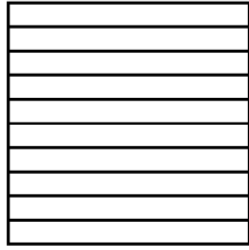
.60

.600

Are these numbers the same or different? If different, which number is the biggest? Smallest?

.4

.04

.004
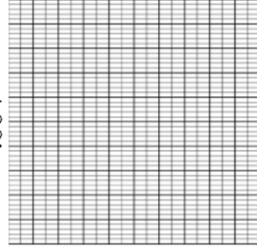
Are these numbers the same or different? If different, which number is the biggest? Smallest?

.3

.25

.205

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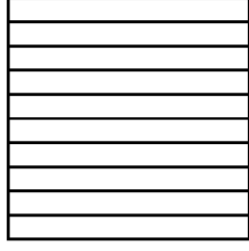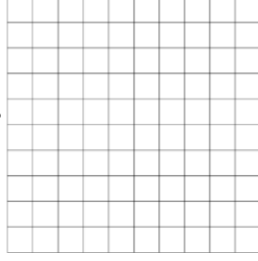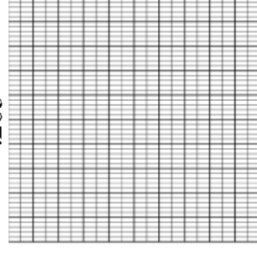
Match the words with the correct numbers:

_____ 1. Fifty-six hundredths   A. .056

_____ 2. Fifty-six thousandths   B.   56,000

_____ 3. Fifty-six thousand   C. .56

_____ 4. Fifty and six hundredths   D. 5.06

_____ 5. Five hundred six thousandths E. 50.06

_____ 6. Five and six hundredths   F. .506

7. Which number in the list above is the SMALLEST?   _____

8. Which number is exactly the same as .56000?   _____

9. Add together .56 + .506. What is the sum?   _____

10. What is .56 - .506?   The difference is   _____

Grew or shrunk?	**Grew or shrunk?**
20 × .1 = _____	20 ÷ .1 = _____
20 × .5 = _____	20 ÷ .5 = _____
20 × .75 = _____	20 ÷ .75 = _____
20 × 1.0 = _____	20 ÷ 1.0 = _____
20 × 1.25 = _____	20 ÷ 1.25 = _____

OBSERVATIONS:

When you multiply a number by a decimal < 1, it _____

When you divide a number by a decimal < 1, it _____

When you multiply a number by 1, it _____

When you divide a number by 1, it _____

When you multiply a number by a decimal > 1, it _____

When you divide a number by a decimal > 1, it _____

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Color all equivalent fractions and decimals the same color.

.25

$\frac{4}{5}$

.5

$\frac{2}{8}$

$\frac{1}{8}$

.125

$\frac{2}{5}$

$\frac{3}{4}$

.8

$\frac{1}{3}$

.666…

$\frac{1}{2}$

.05

$\frac{75}{150}$

1/4

.75

2/3

$\frac{1}{20}$

.4

.333…

.03

$\frac{3}{100}$

Circle the larger number:

1.   .507   or   .51

2.   .05   or   .052

3. Write a number between 7.5 and 8.0:

4. Write a number between 7.5 and 7.6:

5. Write .07 as a fraction:

6. Write ½ as a decimal:

7. Add .99 + .1

8. Subtract .02 - .001

9. Multiply 3.5 x .1

10. Divide 3.5 ÷ .05

Scenario I: In 1957, Rochester Methodist Hospital built the first circular nursing unit. Each patient's room was the same distance from the nursing station in the center. Nurses could keep an eye on all of their patients at once and reach each patient quickly. This floor plan has been copied in hospitals all over the world.

Let's say that the center of the ward is 50.75 feet from the outer edge.

radius
50.75
feet
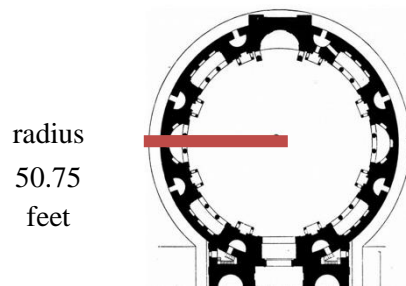
If you took a walk around the outer edge of the circular ward, how far would you walk?

(*Note: This measurement along the edge of a circle is called its **circumference**. To calculate the circumference of a circle, you can use the formula $C = 2\pi r$. The number , pronounced "Pi", can be approximated as 3.14. To find the circumference, multiply 2 times π times the radius of the circle*).

****

The floor of this hospital unit needs to be treated with sealant for easy cleanup. How many square feet of floor are in the unit?

(*Note: This measurement of the inside surface of a circle is called its **area**. To calculate the area of a circle, you can use the formula $A = \pi r^2$. Again, use 3.14 to approximate the number π. Square the radius by multiplying it by itself. Then multiply that result by π. Area is always measured in "square" units, even for a circle!*)

****
Calculate the circumference and the area of each circle below:

Circumference: Circumference:

8cm   1.5cm
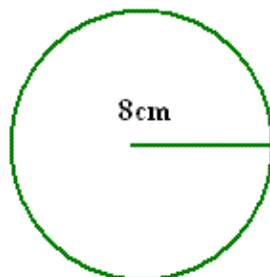
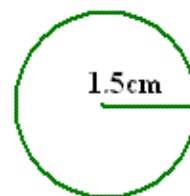Area: Area:
 ALA Unit 3 (page   2)
Scenario II. Fill   in the table for your patients'

medication needs for the day:

Patient	Number of grams of medicine per dose	Number of doses in 24 hours	Total medication in 24 hours
Zane	.25	8	
Yolanda	.5		1.5 grams
Xavier		4	3 grams
Walter	.25		.75 grams

****

Scenario III. A case of insulin syringes costs $ 12.69. A box of tongue depressors costs $15.75.

a) How much will 24 cases of insulin syringes cost?

b) There are 90 syringes in a case. How much does each syringe cost?

c) There are 500 tongue depressors in a box. How much does each individual tongue depressor cost?

d) You need to order 3 cases of syringes and 5 boxes of tongue depressors. How much will you pay?

e) Another company offers 100 syringes for $13.50. Is this a better deal?

IV. Graphic Practice:

a) How many miles has this car driven? Notice that the 6 on the right has a white background. Write your answer in numbers and in words.

481516

b) How many cubic centimeters (cc) of liquid are in the syringe?

3   4   5 cc

c) Last checkup, this patient weighed 140 pounds. His current weight is shown on the scale below. How much weight did he lose?

126.4

d) The following line graph shows how screening for a disease increases life expectancy:
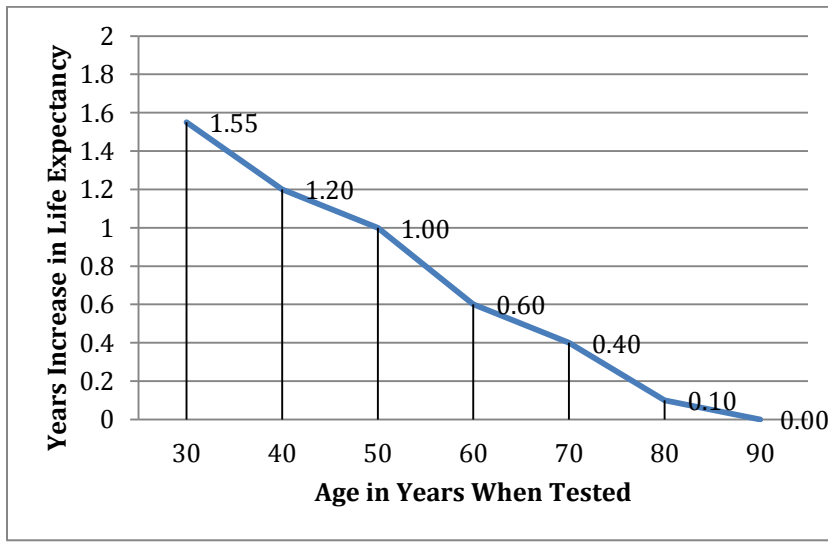
Approximate the increase in life expectancy if a person is tested at age 35.

Approximate the increase in life expectancy if a person is tested at age 60.

What is the **difference** between the two results you obtained above?

V: FACT: 7 out of every 100 men, as well as 1 out of every 1000 women, are color blind. Write each of these ratios as a decimal. Who is more prone to color blindness—men or women?

   FACT: A marathon is 26.2 miles long. How long is a half-marathon?

****

VI. Graphic Practice

Blood Alcohol Level by Weight

Number of Drinks Consumed per Hour

Weight	1	2	3	4	5	6	7	8	9
100	.04	.08	.11	.15	.19	.23	.26	.30	.34
120	.03	.06	.09	.12	.16	.19	.22	.25	.28
140	.03	.05	.08	.11	.13	.16	.19	.21	.24
160	.02	.05	.07	.09	.12	.14	.16	.19	.21
180	.02	.04	.06	.08	.11	.13	.15	.17	.19
200	.02	.04	.06	.08	.09	.11	.13	.15	.17
220	.02	.03	.05	.07	.09	.10	.12	.14	.15
240	.02	.03	.05	.06	.08	.09	.11	.13	.14

a) Who has a higher blood alcohol level?

   -- a 140-pound man who has had 4 drinks in the last hour
   -- a 220-pound man who has had 5 drinks in the last hour

b) How many drinks would a 240-pound man have in an hour to have a blood alcohol level of .13?

c) How many drinks would a 100-pound man need to give him the same blood alcohol level as a 240-pound man who had 5 drinks in an hour?

Resources:

Scenario I.
Pantheon, Rome, floor plan, taken from   taken from Georg Dehio/Gustav von Bezold: *Kirchliche Baukunst des Abendlandes,* is available in the public domain. Image cropped, red line added.

IV. Graphics Practice
a) Awesome by Jason Carlin is licensed under CC BY-NC-SA 2.0; Cropped from original work.

b) Veneno rojo! by Adrián Afonso is licensed under CC BY-NC-SA 2.0