

SETON SCHOOL
SUMMER MATH REFRESHER PROGRAM

PRE-ALGEBRA REVIEW

Many studies have shown that, during the summer, students lose a substantial portion of their math skills acquired over the course of a school year. This puts them at a disadvantage upon returning for a new school year, as the expectations of a new course presuppose the skills and knowledge taught in the previous course.

The Seton math department, in cooperation with the administration, has begun a program similar to the summer reading program for English. Our hope is that this program will help students transition out of the summer recess and into their new math courses smoothly and with less stress.

We recommend that the sessions be worked gradually over several weeks, perhaps one session done in a day, and two or three days a week. There are ten sessions, each one of which should take about a half hour, though the times will undoubtedly vary among students.

As with summer reading, the work is expected to be done before the new school year starts. You are responsible for keeping your papers and having them ready to turn in the first day or whenever your teacher asks for them. The summer work will count for approximately 5% of your first quarter grade in the next math course. (For this review, that would be Algebra I.)

IMPORTANT: Do all your work on separate paper. It is essential that you show all your work, and that it is organized and legible. Put your name clearly on each page of work. If these conditions are not met, you will not get full credit for your work. Also, I strongly suggest that you scan of copy your papers, so that if you lose your originals, you will have a backup.

PRE-ALGEBRA REVIEW SESSION 1 – No calculators

1. Evaluate the expression when $x = -3$, $y = -6$, and $z = 5$.
- $$2y + 3xz$$
-

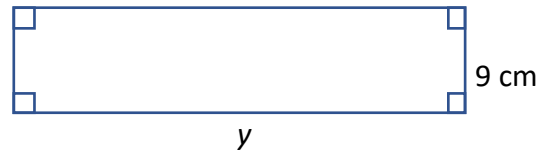
Illustration of the distributive property:
 $10(x - 12) = 10x - 120$

Example: Simplify: $9x + 3(5 - 2x)$
Answer: $9x + 3(5 - 2x)$
 $= 9x + 15 - 6x$
 $= \underline{3x + 15}$

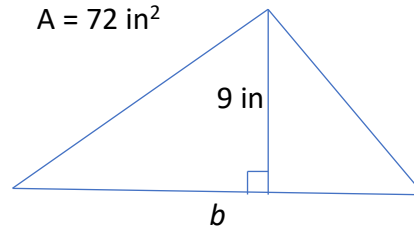
Example: Simplify: $6(x - 2y) - 9(x - 7y)$
Answer: $6(x - 2y) - 9(x - 7y)$
 $= 6x - 12y - (9x - 63y)$
 $= 6x - 12y - 9x + 63y$
 $= \underline{-3x + 51y}$ or $\underline{51y - 3x}$

2. Use the distributive property to simplify:
 $4y + 6(y - 11)$
3. Simplify: $-3(x + 4) - 12(x - 5)$
4. Simplify: $-12g + 6f - 13g - 21f$
5. Solve: $y - \frac{3}{4} = 5\frac{1}{2}$

6. A plant is 47 cm tall. It grows 5 cm per year. Write and solve an equation to find how many years it will take to grow to a height of 72 cm.
7. Find the value of y . ($P =$ perimeter)
 $P = 68$ cm



8. Find the value of b . ($A =$ area)
 $A = 72$ in²



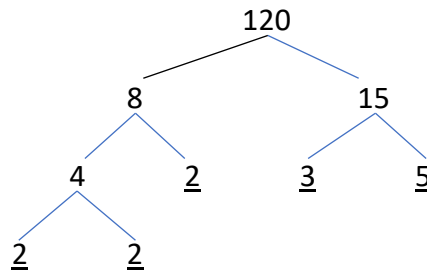
Solve the following inequalities.

9. $6x < -21$
10. $-\frac{2}{3}y \geq 34$

PRE-ALGEBRA REVIEW SESSION 2 – No Calculators

1. Evaluate: $6 + 4 \cdot 2^3 - 11$
2. Evaluate the following expression at $x = 6$ and $y = 3$.
- $$\frac{7y - 3}{4x + 12}$$
3. The population of a town is 3500. It is growing at the rate of 35 people per year. Write a variable expression for the population, P , of the town after t years.
4. How far does a train travel in 4.5 hours at the rate of 54 miles per hour?
5. Simplify: $12(7 - 2y) + 16y$

Example: Write the prime factorization of 120.



Answer: $120 = 2^3 \cdot 3 \cdot 5$

6. Write the prime factorization of 147.

Multiply: Express each answer as a power.

7. $21^{12} \cdot 21^{13}$ 8. $s^{-5} \cdot s^{13}$

PRE-ALGEBRA REVIEW SESSION 2 (CONTINUED) – No calculators

9. Evaluate: $3\frac{2}{5} + 2\frac{4}{15}$

10. Evaluate: $7\frac{3}{8} - 2\frac{5}{12}$

PRE-ALGEBRA REVIEW SESSION 3 – No calculators.

Find the sum, difference, product, or quotient.

1. $23.71 - 9.285$

2. $-0.403 + 2.19$

3. $2.301 \cdot (-4.5)$

4. $-7.992 \div 2.16$

5. Write as a decimal: $\frac{8}{15}$

6. Write as a decimal: $\frac{7}{40}$

7. Solve: $3(w-6) = 39$

8. Write as a decimal and a simplified fraction:
58%

9. A customer bought a cantaloupe for \$1.35, and 3 heads of lettuce. Another customer bought 5 cans of soup for \$0.84 each. Both customers spent the same amount of money. What is the price of one head of lettuce?

10. Divide. Express as a power. $\frac{37^{16}}{37^3}$

PRE-ALGEBRA REVIEW SESSION 4 – No Calculators

Write the equivalent rate.

1. $\frac{\$4.75}{5 \text{ tickets}} = \frac{?}{\text{ticket}}$

2. $\frac{2.5 \text{ yds}}{\text{minute}} = \frac{? \text{ yds}}{\text{hour}}$

Write as a simplified fraction. (3 and 4)

3. 0.28

4. $0.\bar{2}$

5. Solve: $3x = 4 - 9x$

A box contains the letters of the word BABOON.
You draw one letter from the box. Find the probability of the event. (6 – 8)

6. Drawing the letter B.

7. Drawing the letter N.

8. Drawing the letter S.

C = circumference, r = radius, d = diameter

$C = \pi d, \quad C = 2\pi r$

Use $\pi = 3.14$

9. $C = 28.26 \text{ cm}, r = ?$

10. $d = 25 \text{ ft}, C = ?$

PRE-ALGEBRA REVIEW SESSION 5 – No Calculators

1. Divide: $2\frac{2}{3} \div 5$

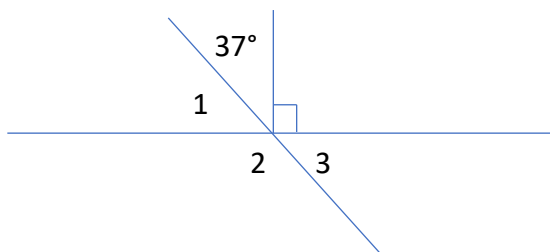
2. Multiply: $4\frac{1}{8} \cdot \left(-3\frac{5}{11}\right)$

3. Write in scientific notation: 34,200,000 m

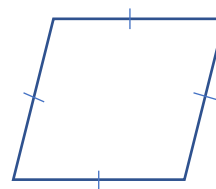
4. Divide: (Answer in scientific notation.)

$$\frac{3.2 \times 10^6 m}{4 \times 10^3 s}$$

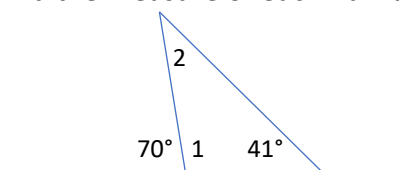
5. Find the measure of each numbered angle.



6. Classify the polygon as specifically as possible.



7. Find the measure of each numbered angle.



8. State whether each number is rational or irrational. Explain.

a. $\frac{7}{13}$ b. $\sqrt{\frac{9}{25}}$ c. $\sqrt{24}$

9. Solve. $x^2 = \sqrt{121}$

10. Solve. $7 + x^2 = 71$

PRE-ALGEBRA REVIEW SESSION 6 – Calculators Allowed

$A = \text{area}$, $S = \text{surface area}$, $V = \text{volume}$, $P = \text{perimeter}$, $h = \text{height}$, $B = \text{area of base}$, $L = \text{slant height}$

Prism: $S = 2B + Ph$, $V = Bh$

Cylinder: $S = 2\pi r^2 + 2\pi rh$, $V = \pi r^2 h$

Pyramid: $S = B + \frac{1}{2} PL$, $V = \frac{1}{3} Bh$

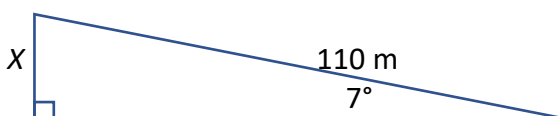
Cone: $S = \pi r^2 + \pi rL$, $V = \frac{1}{3} \pi r^2 h$

(Note: When calculating for π in this session, please use the “ π ” button on your calculator.)

1. Find the area of a circle with a radius of 7.1 m. Round to the nearest tenth of a m^2 .

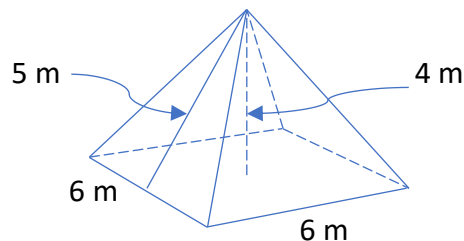
2. Find the diameter of a circle with an area of 59 cm^2 . Round to the nearest tenth of a cm. (Hint: First find the radius.)

3. Find x below. Round to the nearest tenth of a meter.



4. What is the surface area of a cone with $r = 5$ and $L = 7$?

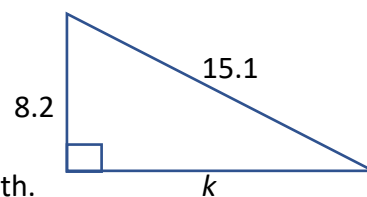
5. For the figure below, find S .



6. For the figure above, find V .

7. Completely identify the shape above. (2 words)

8. Find k in the figure at the right, to the nearest hundredth.



PRE-ALGEBRA REVIEW SESSION 6 (CONTINUED) – Calculators Allowed

9. Solve for x . Round to the nearest hundredth.
(Hint: There are more than one answer.)

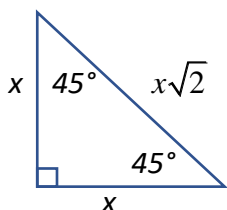
$$x^2 - 21 = 17$$

10. Find the surface area of a cylinder with a radius of 5 m and a height of 8 m. Round to the nearest tenth of a square meter.

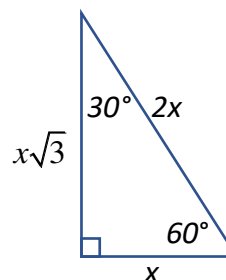
PRE-ALGEBRA REVIEW SESSION 7 – No calculators

Recall the two special right triangles:

**45°-45°-90°, or
Isosceles Right**

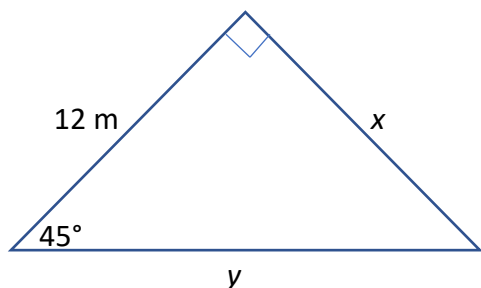


30°-60°-90°

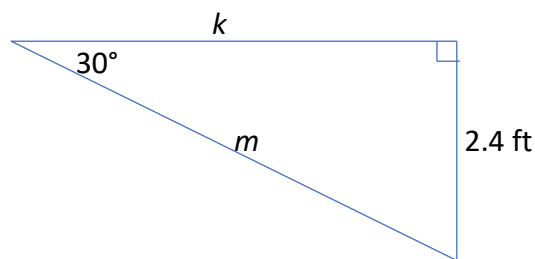


Find the missing variables.

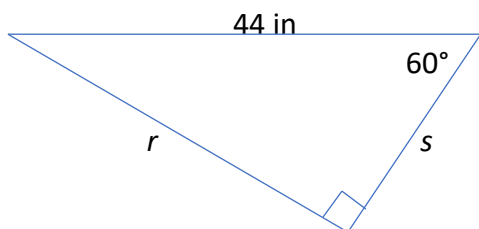
1.



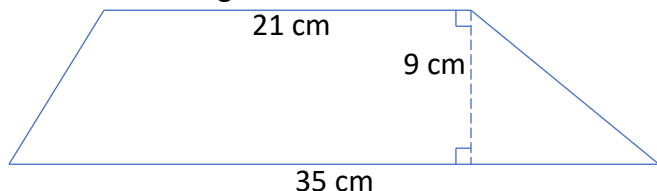
2.



3.



4. Name the figure. Then find the area.



5. Solve and graph: $x + 4 \leq 3x - 6$

6. Carlos and Martin are on the same basketball team. So far this season, Carlos has made 27 of 48 free throws, and Martin has made 50 of 80. Who has the better free throw percentage? Explain your answer.

7. Last week, Bethany had \$340 in her bank account. Today, after depositing her paycheck for 24 hours work, she has \$520 in her account. Write and solve an equation to find Bethany's hourly wage.

8. Write the following numbers in order from least to greatest.

$$\frac{3}{4}, \quad 0.7\bar{5}, \quad \frac{7}{9}, \quad 0.\bar{75}$$

9. Find the GCF (Greatest Common Factor) and the LCM (Least Common Multiple) of the following integers.

28, 105

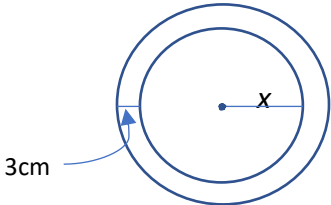
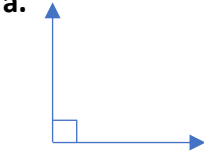
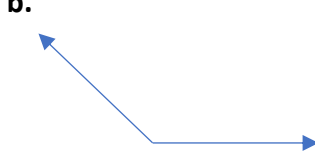
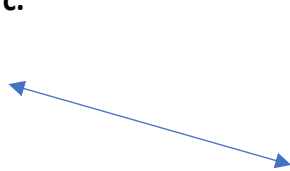
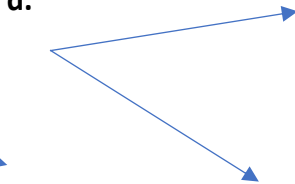
10. Find the mean, median, mode, and range of the following numbers of children in ten families.

5, 3, 8, 2, 6, 5, 11, 1, 7, 4

PRE-ALGEBRA REVIEW SESSION 8 – No Calculators

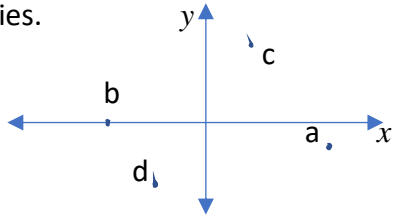
- The length and width of a room are 28 ft 3 in and 18 ft 7 in, respectively. How much longer is the room than it is wide? Answer in feet and inches.
- Simplify each of the following.
 - $-|-12|$
 - $-(-12)$
 - $|12|+|-12|$
 - $(12)+(-12)$
- Write as a mathematical expression:
(Do not attempt to solve.)
14 less than the quotient of 7 and a number
- A membership at a bowling club costs \$89 for a year. It costs \$4 each day you bowl if you are a member and \$7 if you are not a member. Write and solve an inequality to find how many days in a year you would need to bowl so that getting a membership is cheaper than not getting one.
- What number is 28% of 430?
- Candace wants to buy a sweater marked at \$40.50. If sales tax is 6%, what would be the total cost of the sweater, including tax?
- Which is larger, 35% of 68, or 68% of 35? Explain.
- Write and solve an equation for the following verbal sentence:
12 times a number is 14 times one less than the number.
- Graph the following points.
 $(6, -2), (-3, -2), (-3, 5), (6, 5)$
 - Connect them to form a figure.
 - Find the perimeter of the figure.
- What number am I? Here are my clues.
I am a two-digit number.
I am a prime number.
I am one more than a perfect square.
The sum of my digits is more than 9.

PRE-ALGEBRA REVIEW SESSION 9 – No Calculators

- What is the probability that a two-digit perfect square selected at random will have tens digit larger than its units digit? Explain.
- Find the value of x . Use $\pi = 3.14$.
Circumference of large circle = 87.92 cm.

- Zachery would very much like to have a 90 or better average for this quarter in math. His grade for the quarter is the simple average of 7 tests. If his average for the first 6 tests is 88.5, what must he get on his last test to bring his average for the quarter up to 90?
- Which is larger -3^5 or 5^3 ? Explain.
- Match the following angles with their types. (Write one word for each **a – d.**)
Acute, Obtuse, Right, Straight
 - 
 - 
 - 
 - 
- A serving size of a snack is $1\frac{3}{4}$ oz. If the snack bag contains 18 oz, how many servings are in the bag? Answer as a simplified mixed number.

PRE-ALGEBRA REVIEW SESSION 9 (CONTINUED) – No Calculators

7. Find the quadrant or axis in which each point (a – d) lies.

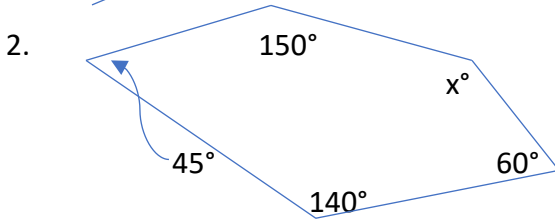
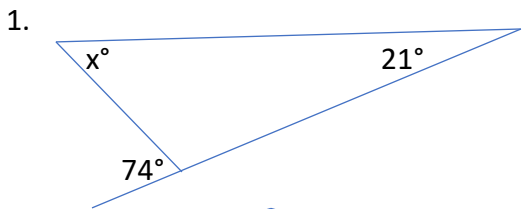


8. Solve: $\frac{g}{9} - 21 = -10$

9. A family goes out to dinner. The food bill is \$57.00. If the family adds a 20% tip to the cost of the food, and there is an 8% sales tax on the food, what is the total cost?
10. If it takes Toni 3.5 hours to drive 203 miles, what is her average speed in miles per hour?

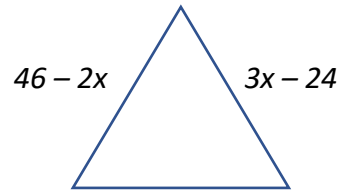
PRE-ALGEBRA REVIEW SESSION 10 – No Calculators

Find x in each of the following figures.



3. Which set of numbers is a Pythagorean Triple?
a. 6, 8, 10 b. 9, 9, 12 c. 4, 5, 6
4. Give the next two terms in the pattern.
9, 15, 21, 27, ?, ?
5. Find the lowest common denominator.
 $\frac{11}{15}, \frac{1}{10}, \frac{2}{9}$
6. Which of the following pairs is relatively prime?
a. 21, 91 b. 35, 102 c. 47, 141
7. Express as a unit rate.
 $\frac{105 \text{ bracelets}}{3 \text{ crates}}$

8. The figure below is an equilateral triangle. Find x and the perimeter of the triangle.



9. Simplify (write without an exponent): $(-13)^0$
10. The following solution to an equation is erroneous. Describe the error and redo it correctly.

Solve:

$$2(10x + 7) = 18x + 4$$

$$20x + 7 = 18x + 4$$

$$\frac{-18x}{2} \quad \frac{-18x}{2}$$

$$2x + 7 = 4$$

$$\frac{-7}{2} \quad \frac{-7}{2}$$

$$\frac{2x}{2} = \frac{-3}{2}$$

$$x = -1.5$$