


# Pre-Algebra Comprehensive Overview

## Chapter 1: Whole Numbers

Simplify the following. Do not use a calculator. 

1. $637 + 62$	2. $458 - 73$	3. $234 + 87$
4. $264(4)$	5. $\frac{102}{6}$	6. $\frac{228}{4}$

Answer the following questions. Do not use a calculator. 

7. What are the factors of the number 16?	8. Find the product of 14 and 9. Write the math problem, then find the answer.
9. A box of oranges contains 8 oranges. If you have 6 boxes, how many oranges do you have total?	
Math Problem:	Answer:

Simplify the following expressions. Do not use a calculator. 

10.  $3^4$

11.  $12 + (14 - 6) + 2^3$

Chapter 2: Integers

Compare the following numbers. Use  $>$ ,  $=$ , or  $<$ .

1.  $-1$  \_\_\_  $3$

2.  $-7$  \_\_\_  $-4$

3.  $0$  \_\_\_  $-2$

Simplify the following. Do not use a calculator. 

4.  $-7 + 10$

5.  $10 - 14$

6.  $\frac{40}{-5}$

7.  $-2 - 6$

8.  $\frac{-28}{-7}$

9.  $8(-4)$

10.  $(-8)^2$

11.  $(-6)^2$

12.  $-4^2$

Chapter 3: Decimals

Compare the following numbers. Use  $>$ ,  $=$ , or  $<$ .

1. $5.35 \underline{\hspace{1cm}} 5.321$	2. $-4.1 \underline{\hspace{1cm}} - 6.7$	3. Round to the nearest hundredth: 7.485
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Simplify the following. Do not use a calculator. 

4. $7.664 - 3.4$	5. $24.15(6)$	6. $\frac{13.68}{3}$	7. $\sqrt{36}$
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## Chapter 4: Fractions

Answer the following. You may use a calculator.



1. Convert to a decimal: $\frac{3}{5}$	2. Compare: $\frac{5}{2}$ $\frac{12}{5}$	3. Put in order from least to greatest: $\frac{2}{3}, \frac{1}{8}, \frac{7}{2}, \frac{5}{6}$
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Answer the following. Do not use a calculator.



4. Reduce: $\frac{8}{12}$	5. Add: $\frac{3}{4} + \frac{2}{5}$	6. Subtract: $\frac{5}{9} - \frac{1}{2}$
7. Multiply: $5 \left(\frac{3}{7}\right)$	8. Multiply: $\frac{4}{7} \left(\frac{3}{8}\right)$	9. Divide: $\frac{9}{10} \div \frac{1}{2}$

Chapter 5: Strengthening the Skills

**Simplify the following. Do not use a calculator.**



1.  $-15 + |5 - 11| \div 2$

2.  $(-4 + 1) + |-8| + 3^2$

**Simplify the following. Do not use a calculator.**



3. Find the GCF of the following:  
24 and 30

4. Find the prime factorization of the following. You can use a factor tree to help.  
28

Chapter 6: Variables

Evaluate the following expressions. Do not use a calculator.



1.  $5a - 2$  if  $a = -4$

2.  $y^2 - 2y + 3$  if  $y = -4$

Simplify the following expressions. Do not use a calculator.



3.  $6b + 9 - 7$

4.  $-3x - 2 + 9x + 8$

5.  $-8(4m)$

6.  $-9x(-4y)$

7.  $\frac{-4x}{-10y}$

8.  $\frac{-6xy}{15xz}$

## Chapter 7: Exponents



Use the exponent rules to simplify the following expressions. Do not use a calculator.

1. $(x^2)^5$	2. $x^6(x^2)$	3. $(7y^5)^2$
4. $\frac{3x^{12}}{5x^4}$	5. $c^0$	6. $\frac{4}{14x^{-2}}$

7. Write in scientific notation: $0.0002$	8. Write in scientific notation: $32,400,000$
9. Write in standard notation: $4.72 \times 10^6$	10. Write in standard notation: $3.7 \times 10^{-7}$

Chapter 8 & Chapter 9: Solving Equations

Solve the following equations. Leave answers in fraction form when necessary. Do not use a calculator. 

1.  $x - 2 = -14$

2.  $-6x = 42$

3.  $7x - 3 = -17$

4.  $-\frac{a}{3} + 6 = -2$

5.  $2 = -9x - 4$

6.  $-5 = 5(x - 4)$

7.  $-8y + 2 + 2y = 32$

8.  $6x - 12 + x = 15$



## Chapter 10: Word Problems

Solve the following word problems by first writing an equation, and then solve the equation and circle the solution. YOU MAY USE A CALCULATOR.

1. The sum of 3 times a number and 6 is equal to 18. Find the number.

2. A company sells funny hats for \$4.75 each. Last week, they made \$855. How many funny hats did they sell?

3. You make \$13 per hour at a job, and you have \$200 already saved. After working one week, the total amount you had at the end of the week was \$616. How many hours did you work?

4. Lisa is going to visit her friend. She has to drive 125 miles on an interstate that has a speed limit of 75 mph. Assuming Lisa drives the speed limit, how long will it take her to get to her friend's?

## Chapter 11: Solving Inequalities

Solve the following inequalities. Then graph the solution on a number line. Do not use a calculator. 

1.  $\frac{x}{4} + 9 \leq 11$

2.  $-7x - 4 > 24$

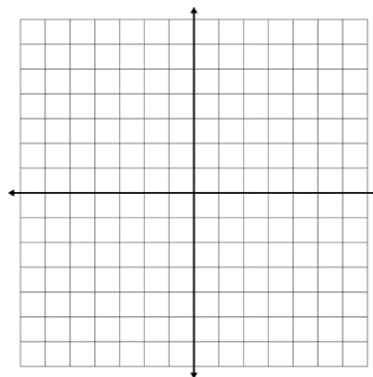
Answer the following question by first writing an inequality, then solving it to find the solution. YOU MAY USE A CALCULATOR.

3. Your club is putting on a music show to raise money. They are selling tickets for \$8 each, and they want to raise at least \$200 for new equipment. How many tickets do they need to sell? In other words, what is the range of tickets sales they need to have in order to raise the amount of money they want?

Chapter 12: Graphing

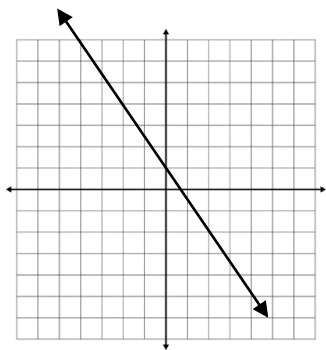
Graph the following equations using a table of values. Do not use a calculator. 

1.  $y = x + 4$



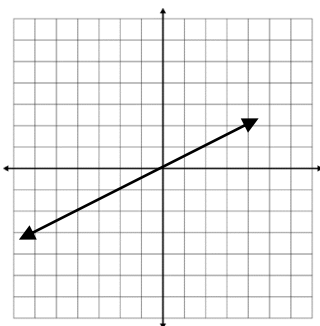
Find the slope of the following lines.

2.



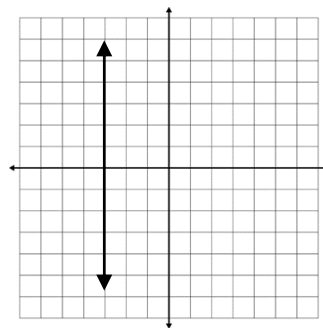
$m =$

3.



$m =$

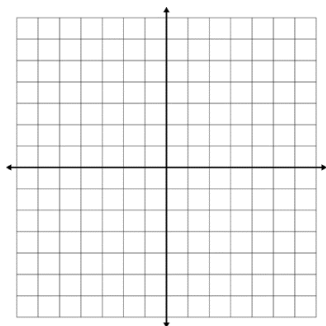
4.



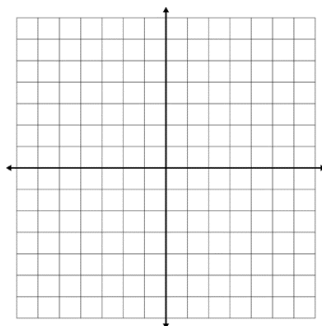
$m =$

Graph the following equations using slope-intercept form.

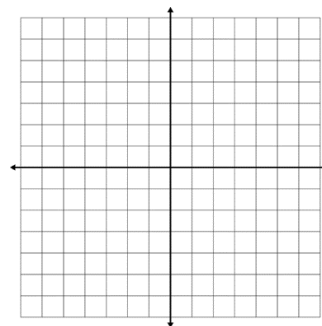
5.  $y = -\frac{1}{3}x - 2$



6.  $y = 3x + 1$



7.  $y = x - 4$



## Chapter 13: Ratio, Proportions, and Percents

You may use a calculator for the following.

1. Write the following as a ratio in fraction form:

A baseball player had 24 hits out of 33 times batting. Find the ratio of hits to NON-hits.

2. A package of 3 pomegranates cost \$10.99. How much did each pomegranate cost? You may use a calculator. Round to the nearest hundredth.

3. Solve the following proportion.

$$\frac{x}{4} = \frac{7}{10}$$

4. Write a proportion for the following word problem, then solve the proportion to find the answer.

It takes 2 large pizzas to feed 7 people. If you ordered 12 pizzas, how many people can you feed?

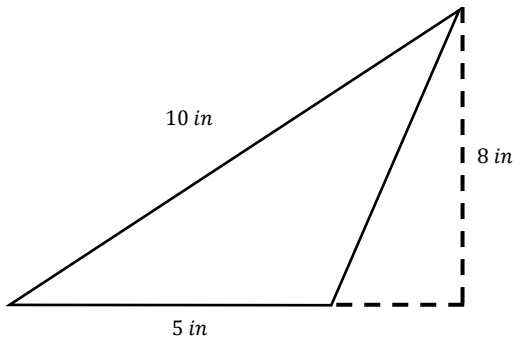
5. What percent of 56 is 42?

6. 70% of the workers at a research company work from home. How many total employees are there if 42 people work from home?

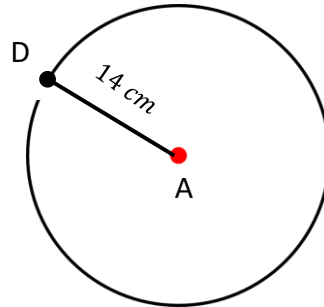
Chapter 14: Geometry

Answer the following questions. YOU MAY USE A CALCULATOR.

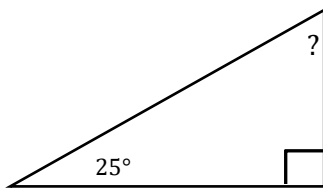
1. Find the area of the following.



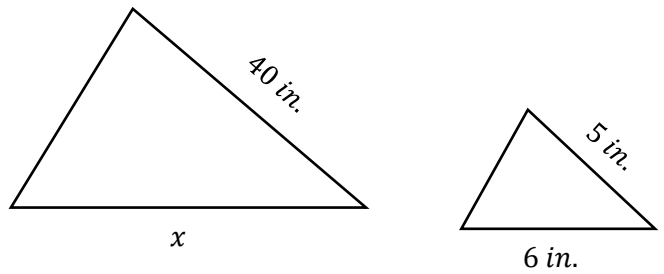
2. Find the area of the following.



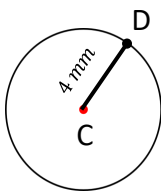
3. Find the missing angle.



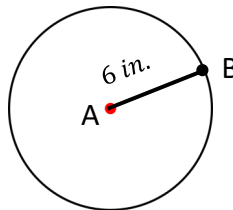
4. Find the missing side.



5. Find the circumference. Leave answer in decimal form.



6. Find the circumference. Give an exact answer (leave answer in pi form).



Chapter 15: Probability and Statistics

**Find the probability of the following. Express your answer in percent form. Round to the nearest tenth. YOU MAY USE A CALCULATOR.**

1. A die is rolled three times. What is the probability of getting an odd number on each roll?

2. A spinner containing the numbers 1-6 is spun 3 times. Find the probability that it will land on 6 every time.

**A bag contains tiles numbered 1-30. A tile is selected, replaced, and then another is drawn. Find the probability of the following. Express your answer in percent form. Round to the nearest tenth.**

3.  $P(7 \text{ then } 10)$

4.  $P(\text{even number then } 20)$

Answer the following questions. YOU MAY USE A CALCULATOR. Round to the nearest hundredth when necessary.

5. The chart shows the number of sit-ups Hannah had done in 1 minute over the past 7 days.

Day	Number of sit-ups
Sun.	40
Mon.	37
Tues.	45
Wed.	19
Thurs.	49
Fri.	50
Sat.	46

Mean:

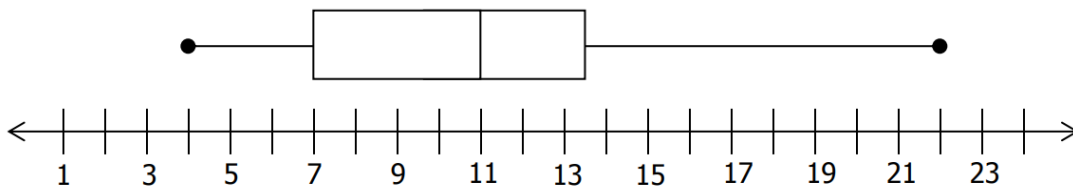
Median:

Mode:

6.

Shauna is purchasing a new car. She has 4 choices of engine size, 6 choices of interior color, and 5 choices of exterior color. How many options of cars does she have?

7.



What is the range?

What range of numbers make up the lower quartile?

What range of numbers make up the upper quartile?

What is the median?

What is the range of numbers of the highest 25% of the data?

What is the range of numbers of the upper 75% of the data?

What is the range of numbers in the lower 50% of the data?