Math 6 Review

Number Theory

Find the Least Common Multiple (LCM) of the following whole numbers.

1) 9, 12   2) 15, 40   3) 48, 128

Find the Greatest Common Factor (GCF) of the following whole numbers:

4) 9, 12   5) 15, 40   6) 48, 128

7) You have a collection of pennies. You can make stacks of 3 pennies, 4 pennies, or 9 pennies with none left over. What's the smallest number of pennies you could have?

8) I have 150 markers and 45 pieces of paper to give my students. What is the largest number of students I can have in my class so each gets an equal number of markers and an equal number of pieces of paper?

9) List all the factors of the following numbers. Circle the appropriate categorization of each number (prime or composite).

27: _____; Prime   Composite

7: _____; Prime   Composite

80: _____; Prime   Composite

225: _____; Prime   Composite

10) Is 1002 divisible by 2?_____ Explain. _____

       by 3?_____ Explain. _____

       by 4?_____ Explain. _____

       by 5?_____ Explain. _____

       by 6?_____ Explain. _____

       by 9?_____ Explain. _____

11) Two radio stations are playing "Hallelujah." XRT plays the song every 36 minutes and NPR plays it every 24 minutes. Both stations play the song at 3:00pm. When is the next time the stations will play the song at the same time?

12) Mike and Ike are performing live. This year they want to incorporate a light show. They spoke with the owner of the venue and decided that red lights will flash every 5 seconds, blue lights every 12 seconds and yellow lights will flash every 15 seconds. How many seconds or minutes into the show will all three lights flash at the same time?

13) A radio station gave away a $100 bill for every 100th caller. Every 30th caller received free concert tickets. How many callers must get through before one of them receives both a coupon and a concert ticket?

14) Determine whether the following pairs of numbers are relatively prime:
    a) 51, 17   b) 18, 81   c) 15, 24   d) 14, 25

Fractions

Compute.

1) $\frac{1}{3} + \frac{1}{8}$

2) $\frac{5}{6} + \frac{4}{5}$

3) $4\frac{1}{2} + 3\frac{1}{4}$

4) $\frac{3}{8} - \frac{1}{40}$

5) $6\frac{1}{5} - 4\frac{5}{6}$

6) $7\frac{1}{6} - 3\frac{1}{3}$

7) $\frac{1}{3} \times \frac{2}{7}$

8) $\frac{1}{3} \times \frac{3}{4} \times \frac{4}{5}$
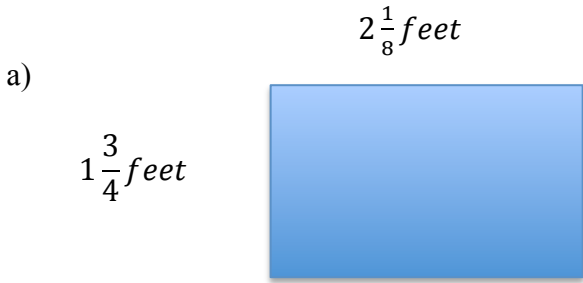
9) $5\frac{1}{2} \times 1\frac{2}{3}$

10) $\frac{1}{2} \div \frac{1}{4}$
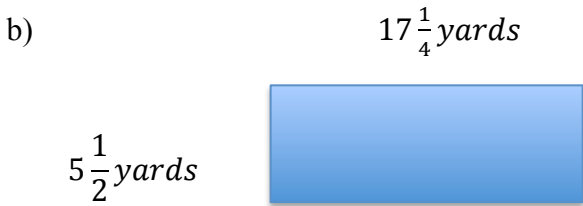
11) $12 \div \frac{3}{4}$

12) $5\frac{1}{2} \div 1\frac{1}{3}$

13) A recipe calls for ¾ cup of flour. You want to make ½ of the recipe. How much flour should you use?

14) Find the area and perimeter of the rectangles below.

a)

$2\frac{1}{8} feet$

$1\frac{3}{4} feet$

Perimeter: _____ Area: _____

b)

$17\frac{1}{4} yards$

$5\frac{1}{2} yards$

Perimeter: _____ Area: _____

15) Tyler was $50\frac{1}{4}$ inches tall when he was 12 years old. He was $47\frac{1}{2}$ inches tall when he was 11 years old. How much did he grow over the year?

16) Sarah has $\frac{2}{3}$ gallon of blue paint and $\frac{7}{12}$ gallon of red paint. If she has a total of $2\frac{1}{8}$ gallons of paint, how many gallons are **neither** red nor blue?

17) Connor practices playing his trumpet for $1\frac{1}{3}$ hours on Friday, $\frac{3}{8}$ hour on Saturday, and $\frac{7}{9}$ hour on Sunday. How many hours did he practice playing his trumpet altogether?

18) There are 96 children in a library. $\frac{5}{8}$ of them are girls. How many of the students are boys?

19) Matthew had $40. He spent $\frac{1}{5}$ of the money on a comic book and $\frac{3}{10}$ on a calculator. How much did money did he spend altogether?

20) Brendan was selling hockey pucks to raise money for his team. He sold $\frac{5}{8}$ of them. If he sold 300 pucks, how many did he start with?

Decimals
Compute.

1) 3.02×5.2

2) $80.401 - 44.23$

3) 2.457×1.8

4) $31.8 \div 3$

5) 2.25×0.02

6) $75.89 - 9.4$

7) 70×0.13

8) 5.1×2

9) 2.5×0.108

10) 338.38 – 129.27

11) 7.45 ÷ 0.5

12) 12.24 ÷ 0.12

13) If apples cost $2.99 per pound, find the cost of 2.5 pounds of apples.

14) If you paid $20.25 for 45 candy bars, what was the cost per bar?

15) Jayden purchased $39.46 in groceries at a store. He paid with a $50 bill. The cashier gave him $10.46 in change. Is this the correct amount of change? If not, how much should Jayden have gotten?

16) Write the simplest form of the fraction that each decimal represents.

    a) 0.5 = _____

    b) 0.75 = _____

    c) 0.2 = _____

    d) 0.875 = _____

    e) 0.4 = _____

    f) 0.125 = _____

17) Round the following numbers to the nearest tenth.

    a) 15.245 = _____

    b) 7.989 = _____

    c) 235.262 = _____

18) Round the following numbers to the nearest hundredth.

    a) 213.563 = _____

    b) 10.39767 = _____

    c) 95.485 = _____

Compare using >, <, =.

19) 0.205 ☐ 0.21

20) 0.1 ☐ 0.1000

21) 5.236 ☐ 5.23

Order from *least* to *greatest*.

22) $0.5, 25\%, \frac{1}{3}, 0.2, \frac{1}{6}$

23) $\frac{1}{3}, \frac{5}{6}, 0.8333, 0.1666, \frac{1}{6}, 30\%$

24) The mass of a jar of jam is 1.9 kg. What is the total mass of 13 jars of jam?

25) Dylan studied a total of 12.4 hours over a period of four days. On average, how many hours did Dylan study each day?

26) Jonathan paid $78.75 for three books that all cost the same amount. What was the cost per book?

27) While at the grocery store, Mrs. Downey noticed that there were two different sized jars of olives. One contained 16.9 ounces and the other 32.55 ounces. What is the difference in size of the two jars of olives?

28) Movie tickets for the matinee at West Newton Cinema cost $8.25. How many friends can I bring if I spend $66 on movie tickets?

29) Kayley bought a dozen daisies for $7.50. Determine the amount she paid per daisy (round to the nearest cent).

Rates, Ratios, Proportions, Percents

1) Several students were asked to name the kinds of animals they saw in the past week at the park. Use the table to answer the following questions.

At the Park	
Animal	Number of Animals
Dog	8
Cat	2
Fish	4
Lizard	2

a) What is the ratio that compares the number of cats seen to the total number of animals seen (simplest form)?

b) What is the ratio of number of fish to dogs (simplest form)?

2) A car gets 300 miles on 25 gallons of gasoline. Write this as a unit rate.

3) To make rice, one cup of rice is added to 2 cups of water. How many cups of water are needed for 5 cups of rice?

4) Which is the better rate of travel? 25 miles in 5 days; 8 miles in 2 days

5) Which is the better buy? 4 movie tickets for $32; 8 movie tickets for $96

6) The ratio of the number of miles walked by Liz in a week to the number walked by Mark in a week is 4 to 3. Mark walked 15 miles. How many miles did Liz walk?

7) Three elephants weigh a total of 13,500 pounds. At this rate, how many pounds do two elephants weigh?

8) Express 40% as a fraction in simplest form.

9) Express 83% as a decimal.

10) Express 0.07% as a decimal.

11) Express 0.08 as a percent.

12) Express 2.2 as a percent.

13) Express 236% as a mixed number in simplest form.

14) Estimate 5% of 59.

15) Estimate 33% of 119.

16) What number is 60% of 80?

17) What number is 65% of 300?

18) What number is 21% of 450?

19) 72 is 48% of what number?

20) Find 45% of 360.

21) 441 is 63% of what number?

22) 15 is what percent of 125?

23) 21 out of 25 is what percent?

24) A student's score was 80% on a math test that had 20 problems. If all of the problems on the test were worth the same number of points, how many problems did the student answer correctly?

25) There are 36 carpenters working on my house. On a certain day, 30 were present. What percent were there? (round to the nearest whole percent)

26) A metal bar weighs 8.15 ounces. 90% of the bar is silver. How many ounces of silver are in the bar?

27) Brooke purchased a couch for $580. The sales tax rate was 3½%. How much sales tax did she pay?

28) Gabriel found a Corvette. He bought the car for 65% of the original price of $7200. What did he pay for the car?

29) Abbey bought a pair of running shoes at 85% of the regular price. She paid $32.89 for the shoes. What was the regular price? (Round to the nearest cent)

30) A theatre cast is made up of 15 men; the rest are women. 60% of the cast are men. How many people are in the cast?

31) Kayla paid $42 for lunch. If she wants to leave a 20% tip for her server, how much will she pay in total?

32) At a sale, shirts were sold for $15 each. This price was 80% of their original price. What was the original price?

33) There are 448 students at High Rock. One hundred twelve of those students play in the band. What percent *don't* play in the band?

34) The Red Sox played 150 games and won 110 of them. What percent of the games did they lose? (round to the nearest tenth)

Algebra
Simplify.

1) 3^4 2) 2^3 3) 1^5 4) 8^0

5) $3^2 + 5(4 - 2)$ 6) $3 + 4 \div 2 - 2$ 7) $10 \div 5 \times 3 - 12 \div 6$

8) $4(3^3 - 8) \div 2$ 9) $3 \times 6 - 8 \div 2$ 10) $12 + 7(3) - 24 \left(\frac{1}{2}\right)$

11) Insert parenthesis to make the statement true.

a) $5^2 - 15 \div 5 + 3 = 5$

b) $12 \div 2 + 4 - 6 \times 3 + 2^3 = 20$

12) Insert parentheses in the expression $4 + 2^3 - 5 \times 2$ in two ways:
   a) so the value is 10

   $4 + 2^3 - 5 \times 2$

   b) so the value is 14

   $4 + 2^3 - 5 \times 2$

13) Evaluate each expression when x = 3

   a) $x^3 + 1$

   b) $6x - x^2$

   c) $12x - \frac{21}{x}$

14) Solve.

a) $5 = n - 9$

b) $3y = 51$

c) $r + 15 = 45$

d) $\frac{x}{12} = 6$

e) $\frac{12}{x} = 6$

f) $4m = 96$

15) Simplify (distribute).

a) $5(m + 2)$

b) $8(3x - 1)$

c) $2(3a - 2b)$

d) $4(2x + 7)$

16) Factor (rewrite using distributive property).

a) $6m + 2n$

b) $15a - 27b$

c) $14c - 4d$

d) $8x + 8$

17) Which of the following statements is true?
   A. $4 < -8$ B. $-1 < -4$ C. $-9 > 0$ D. $-2 > -7$

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18) Which expression has the **greatest** value?

A. $-\left|-13\right|$ B. $\left|-1\right|$ C. $-\left|-22\right|$ D. $\left|20\right|$

19) Order -2.96, $2\frac{1}{9}$, $-2\frac{11}{12}$, and $2.\overline{95}$ from **least to greatest**.

20) Which situation is **not** best described by a negative integer?

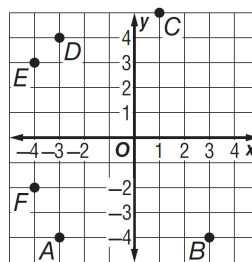F. a height of 75 yards   H. a loss of 9 pounds
G. a decrease of 4 points   I. 3 degrees below zero

21) Identify the point for the ordered pair (–4, 3).

22) Write the ordered pair that names point A.

23) Write the ordered pair that names point D.

Compute.

24) $6 + 4$

25) $-6 + 4$

26) $-5 + -20$

27) $18 + (-14)$

28) $-4 + 4$

29) $26 + (-27)$

30) $(-4) + (-4)$

31) $-15 + (-14)$

32) Determine the equation from the tables of values.

a)   b)

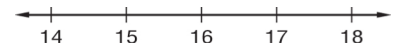| x	y
1	2
2	5
3	8
4	11

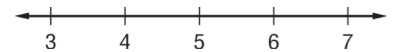| x	y
0	1
1	2
2	5
3	10

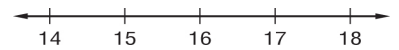**Solve and graph the inequality on the number line.**

33) $x + 7 \leq 11$
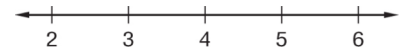
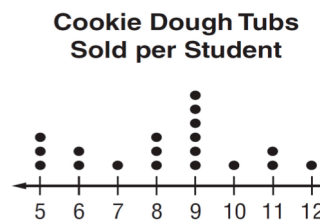34) $m - 4 > 12$

35) $3p \geq 15$

36) $\frac{h}{6} < 3$

Statistics

Refer to the dot plot to answer Exercises 1 and 2.

**Cookie Dough Tubs
Sold per Student**

1. What is the median of the data?

   F. 7   **G.** 8   **H.** 9   **I.** 10

2. What is the mode of the data?

   A. 5   **B.** 7   **C.** 8   **D.** 9

3. What is the median of the data values less than the median called?

    F. third quartile   **H.** interquartile range

    G. first quartile   **I.** range

Use the table for Exercises 4-6.

Dress Costs ($)			
38	50	32	42
50	32	10	50

4. What is the mean of the data?

    A. $38   **B.** $40   **C.** $42   **D.** $50

5. Which measure of center best describes the data?

    F. mean   **G.** median   **H.** mode

6. What is the mean cost without the outlier? Round to the nearest cent if necessary.

    A. $29.40   **B.** $36.75   **C.** $38   **D.** $42

For Exercises 7-9, use the following set of data: 20, 28, 30, 6, 15, 18, 21, 22, 25, 29, 24, and 26.

    7. What are the third and first quartiles of the data?

    8. What is the interquartile range of the data?

    9. What is the mode of the data set?

    10. Emma scored a 76, 90, 83, 95, 88, 96, 94, 96, 98, and 96 on her science tests last quarter. What would she have to score on the next test in order to have an average (mean) of 92 on her science tests?

For Exercises 12 and 13, use the box plot. It shows the number of days on the market for single family homes in a city.

Home Sales: Days on the Market
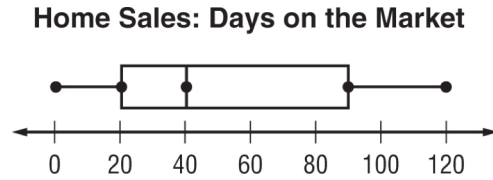
11. What is the median of the data?

    F. 30   **G.** 40   **H.** 90   **I.** 120

12. What percent of the homes were on the market less than 90 days?

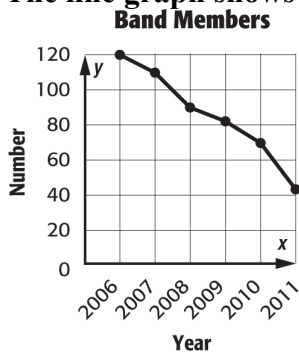   **A.** 0%   **B.** 25%   **C.** 50%   **D.** 75%

For Exercises 14 and 15, refer to the histogram. It shows the prices of different calculators.
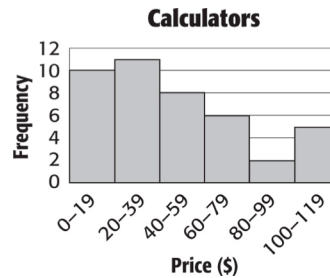
13. Which price range has the greatest frequency?

    F. $100-$119   **H.** $80-$99

    G. $20-$39   **I.** $11

14. How many calculators cost $80 or more?

    A. 7   **B.** 6   **C.** 3   **D.** 2

The line graph shows the number of band members in a high school for several years.
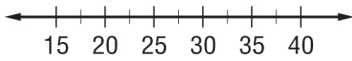

15. If the trend continues, what is the best prediction for the number of students that will be band members in 2012?

    F. 25   **H.** 59

    G. 45   **I.** 100

16. The number of toys donated by students in 12 classes is shown below. Find the median, upper and lower quartiles for the data set.

16, 16, 17, 19, 20, 23, 24, 25, 29, 31, 33, 38

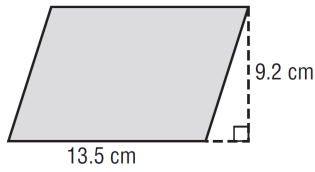**17.** Draw a box plot for the data in Exercise 17.

Number of Toys

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  ├──┼──┼──┼──┼──┼──┼──┼──┼──┼──┤
 15  20  25  30  35  40
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18. Ali surveyed people about their favorite music. The results are shown in the table. Which type of display would be best to show the survey results?

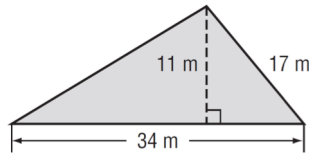| Music	Students
Classical	25
Country	30
Rock	30
Jazz	15

Geometry

1. A package of sticky notes is in the shape of a parallelogram. The dimensions of one sticky note are shown. What is the area of one sticky note?

(9.2 cm, 13.5 cm)

**2.** What is the length of the base of a parallelogram with height 7.3 meters and an area of 65.7 square meters?

3. What is the area of the triangle?

(11 m, 17 m, 34 m)

4. Jaida is buying a triangular-shaped rug. It has a height of $3\frac{1}{2}$ feet and a base of $4\frac{1}{4}$ feet. What is the area of the rug?

5. A triangle has a base of 15 inches and an area of 82.5 square inches. What is the height of the triangle?

**6.** What is the area of the trapezoid?

(20 mm, 12 mm, 29 mm)
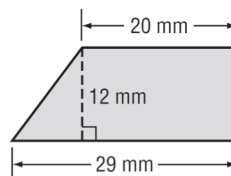
7. A farmer is installing a new fence. The coordinates of the vertices of the fence are $A(1, 1)$, $B(1, 9)$, $C(7, 9)$, and $D(7, 1)$. If each grid square has a length of 5 yards, how much wire is needed for the fence?

For Exercises 8 and 9, refer to the figure at the right that shows the dimensions of Gabby's attic floor.

8. What is the perimeter of the attic floor?

9. What is the area of the attic floor?

29 ft

41 ft

24 ft

12 ft
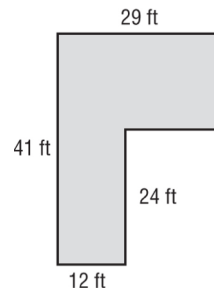
For Exercises 10 and 11, use the following information. A rectangle has vertices $A(2, 6)$, $B(2, 9)$, $C(7, 9)$, **and** $D(7, 6)$**.**

10. What are the dimensions of the rectangle?

11. What is the perimeter of the rectangle?

12. A triangular logo on the back of a T-shirt has a base of $7\frac{1}{2}$ inches and a height of 4 inches. What is the area of the logo?
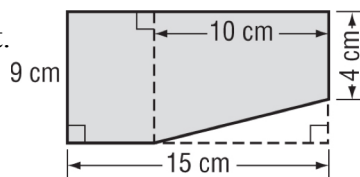
Refer to the parallelogram below for Exercises 13 and 14.

4 ft 6 ft 8 ft
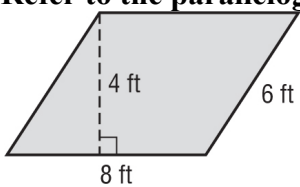
13. Suppose the base and height are each multiplied by $\frac{1}{2}$ What effect would this have on the area?

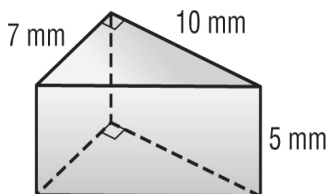**14.** Suppose the side lengths are multiplied by 2. Describe the change in the perimeter.

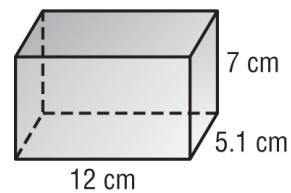**15.** Find the area of the figure at the right.

9 cm   10 cm   4 cm   15 cm

For Exercises 16 and 17, find the volume of each figure.

7 cm   5.1 cm   12 cm

16. V = Bh

17. V = lwh

10 mm   7 mm   5 mm

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18. The lid of a jewelry box is in the shape of a triangular prism. The lid has a height of 12 inches. The area of the triangular base of the lid is $19\frac{1}{8}in^2$. What is the volume of the lid to the nearest tenth?

19. Pat has four rectangular baking pans. Which of the pans has the greatest volume?

    F. Pan A: 8 in. by 15 in. by $1\frac{1}{2}$ in.

    G. Pan B: 9 in. by 13 in. by 2 in.

    H. Pan C: 8 in. by 8 in. by $1\frac{1}{2}$ in.

    I. Pan D: 11 in. by 14 in. by $\frac{1}{2}$ in.

20. A rectangular prism has a volume of 810 cubic meters. It has a length of 10 meters and a width of 9 meters. What is the height of the prism?

21. A rectangular prism has a length of $2\frac{3}{4}$ feet, a width of $4\frac{1}{2}$ feet, and a height of 6 inches. What is the volume of the prism in cubic inches?

22. Draw a net for each of the following three-dimensional figures. Label the dimensions.

a)

3cm

3cm

3cm

3cm

b)

2cm

6cm

1cm

c)

5cm

3 cm

12 cm

8 cm