SUMMER PACKET
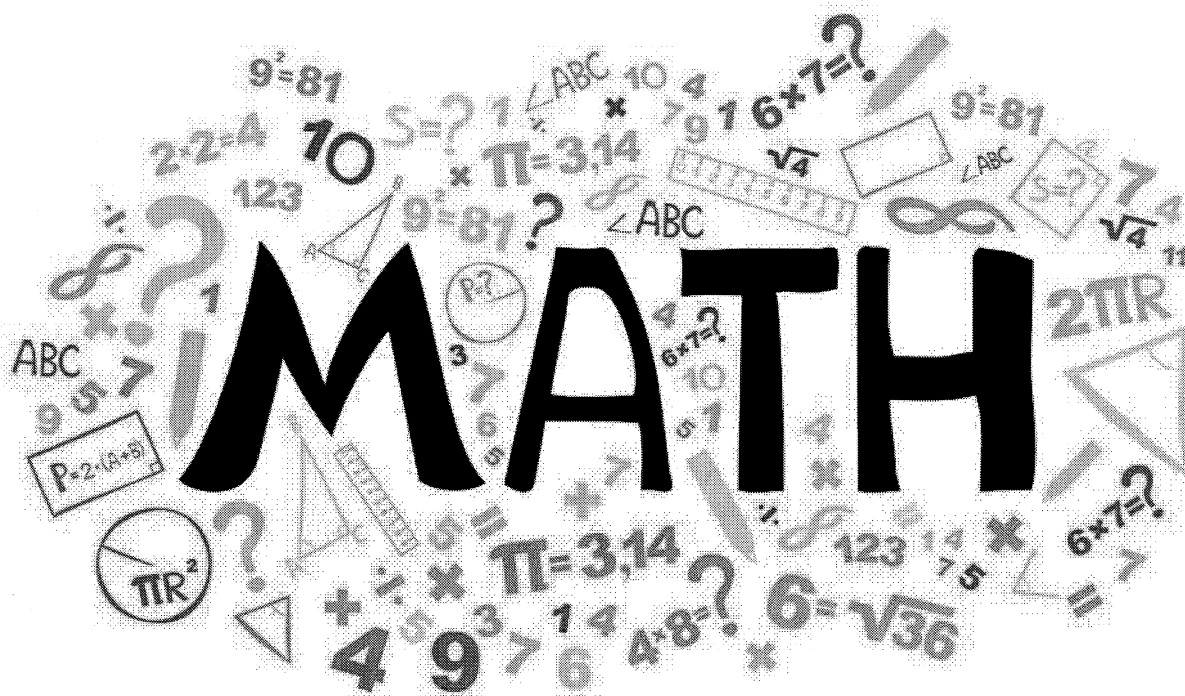# PREPARING FOR 7th GRADE MATHEMATICS

SUFFIELD PUBLIC SCHOOLS

Supply List	Video/ App Resources	Pre-Requisites
• Pencils • Colored Pencils • Notebook	• https://www.khanacademy.org/ • https://mathantics.com/ • https://webmath.com/ • https://www.mathplanet.com/ • http://www.math.com/ • https://www.ixl.com/math/algebra-1 • https://www.wyzant.com • https://purplemath.com	• Rewriting and Simplifying Fractions • Operations with Fractions (Adding, Subtracting, Multiplying, and Dividing) • Operations with Decimals (Adding, Subtracting, Multiplying, and Dividing) • Working with percentages. • Finding the Greatest Common Factor • Finding the Least Common Multiple • Graphing Inequalities • Solving simple word problems • Finding areas and perimeters of simple shapes. • Working with data (Mean, Median, and Mode) • Creating Histograms and Box and Whisker plots

To Any student entering 7th Grade Mathematics in the fall –

To ensure your success in 7th Grade Mathematics, you need to be proficient in the foundational skills and concepts that you have learned in 6th Grade Mathematics and in Elementary School, as this will enable you to easily grasp the new concepts that will be covered, and apply them to solve mathematical and real-life problems. We highly recommend that you take time to review and solidify your knowledge of these topics over the course of the summer. Just like we take the time to practice our skills in other activities (soccer, baseball, softball, dancing, running, swimming), we also need to practice our mathematical skills.

Learning Mathematics is like building a house; if your foundation is weak, you can't build high, and if there are gaps or floors that are not complete, the next floor is nearly impossible to build. **Our wish and hope for all our math students is not just to get by, but to excel in mathematics, and to ultimately enjoy and appreciate the beauty and power of mathematics** – a subject we love and hope we can get you excited to continue learning. We are providing you with resources to do as much preparation and solidification of the basic skills needed to engage with the course material fluently and confidently.

Attached is a summer packet which has practice problems for several of the major topics that you have studied over the last couple of years. There are also links to on-line resources that you can access for help. Please take the time to work through the packet by doing a couple of problems each day, and use the resources that are provided for review when you do not remember how to solve a problem. You can certainly use other on-line resources that you can find for help, or ask relatives and/or friends for help.

We wish you a happy summer, and hope you return in the fall with high expectations for yourself, the willingness to ask questions and reach out for help when you are struggling, and with the confidence that you can be successful.

Suffield Public Schools Summer Review
For Students Entering
<u>Math 7</u>

For additional help, you can find online tutorials on specific math concepts and skills at:
http://www.khanacademy.org/
http://www.math.com/

All of the following exercises should be completed without the use of a calculator.

I. **Write the improper fraction as a mixed number in simplest form.**

1) $\frac{21}{6} = \frac{7}{2} = \boxed{3\frac{1}{2}}$

2) $\frac{65}{8} = \boxed{8\frac{1}{8}}$

II. **Write the fraction as a decimal.**

3) $\frac{12}{25} = \boxed{0.48}$

$\frac{48}{100}$

4) $\frac{3}{20} = \boxed{0.15}$

$\frac{15}{100}$

5) $\frac{2}{3} = \boxed{0.66\overline{6}}$

III. **Write the decimal as a fraction or mixed number in simplest form.**

6) .38

$\frac{38}{100} = \boxed{\frac{19}{50}}$

7) .4

$\frac{4}{10} = \boxed{\frac{2}{5}}$

8) .66

$\frac{66}{100} = \boxed{\frac{33}{50}}$

9) 2.55

$2\frac{55}{100} = \boxed{2\frac{11}{20}}$

IV. **Evaluate the following expressions.** (work on next page)

10) $12.45 + 6.7$
$\boxed{19.15}$

11) $8.7 - 6.05$
$\boxed{2.65}$

12) $4.2 \cdot 12.1$
$\boxed{50.82}$

13) $3.3 \div 1.1$
$\boxed{3}$

14) $\frac{3}{4} + \frac{5}{6}$
$\boxed{1\frac{7}{12}}$

15) $1\frac{1}{8} - \frac{1}{2}$
$\boxed{\frac{5}{8}}$

16) $\frac{4}{5} \cdot \frac{10}{12}$
$\boxed{\frac{2}{3}}$

17) $\frac{9}{10} \div \frac{3}{5}$
$\boxed{\frac{3}{2}}$

V. **Solve the following word problems.**

18) Meagan had $45 in her wallet. She spent $15.80 at Panera and $21.77 at Gap. How much money does she have left?

$\$45 - (\$15.80 + \$21.77) = \$45 - \$37.57 = \boxed{\$7.43}$

19) Helen spent an equal amount of money on each of her 7 grandchildren at the fair. If she spent a total of $227.50, how much did each grandchild get?

$7\overline{)\$227.50}$ = 32.50   Each child got $32.50

$$\text{(10)} \quad \begin{array}{r} \overset{1}{} \\ 12.45 \\ \underline{6.70} \\ 19.15 \end{array}$$

$$\text{(11)} \quad \begin{array}{r} \overset{6}{8.\cancel{7}0} \\ \underline{6.05} \\ 2.65 \end{array}$$

$$\text{(12)} \quad \begin{array}{r} 12.1 \\ \underline{4.2} \\ 484 \\ \underline{242} \\ 50.82 \end{array}$$

$$\text{(13)} \quad 1.1\,\overline{|\,3.3}$$
$$= 11\,\overline{|\,33} \quad \overset{\textstyle 3}{}$$

$$\text{(14)} \quad \frac{3}{4} + \frac{5}{6}$$
$$= \frac{9 + 10}{12}$$
$$= \frac{19}{12}$$
$$= 1\tfrac{7}{12}$$

$$\text{(15)} \quad 1\tfrac{1}{8} - \tfrac{1}{2}$$
$$\frac{9}{8} - \frac{4}{8}$$
$$= \frac{5}{8}$$

$$\text{(16)} \quad \frac{4}{5} \cdot \frac{10}{12}$$
$$= \frac{40}{60}$$
$$= \boxed{\frac{2}{3}}$$

$$\text{(17)} \quad \frac{9}{10} \div \frac{3}{5}$$
$$= \frac{9}{10} \times \frac{5}{3}$$
$$= \frac{45}{30}$$
$$= \frac{3}{2}$$

$$\text{(18)} \quad \begin{array}{r} 15.80 \\ \underline{+21.77} \\ 37.57 \end{array} \qquad \begin{array}{r} 45.00 \\ \underline{-37.57} \\ \boxed{87.43} \end{array}$$

$$\text{(19)} \quad \begin{array}{r} 32.50 \\ 7\,\overline{|\,227.50} \\ \underline{-(21)} \\ 17.50 \\ \underline{-(14)} \\ 3.50 \end{array}$$

20) Janelle has $\frac{1}{2}$ of her birthday cake left. There are 8 people, including Janelle, that are going to finish the cake. How much of the original cake does each person get?

Each person gets $\frac{1}{16}$ of the Cake.

$$\frac{1}{2} \div 8 \implies \frac{1}{2} \times \frac{1}{8} = \frac{1}{16}$$

21) Chris, Josh, and Eric are running a 5 mile race together. Chris ran $1\frac{1}{3}$ miles and Josh ran $1\frac{4}{5}$ miles. How many miles does Eric need to run for the team to finish the 5 mile race?

$$5 - \left[1\frac{1}{3} + 1\frac{4}{5} \right] \implies 5 - \left[1\frac{5}{15} + 1\frac{12}{15} \right] \implies 5 - \left[2\frac{17}{15} \right]$$

Continue on next page.

22) You are stuck in a big traffic jam on the freeway and you are wondering how long it will take to get to the next exit, which is $1\frac{1}{2}$ miles away. You are timing your progress and find that you can travel $\frac{2}{3}$ of a mile in one hour. If you continue to make progress at this rate, how long will it be until you reach the exit? Solve the problem with a diagram and explain your answer.

→ (next page)

VI. **Convert the following decimals into a percent.**

23) .4

.40 = (40%)

24) .03

.03 $\frac{3}{100}$ (3%)

25) 1.25 $1\frac{25}{100}$ (125%)

VII. **Convert the following fractions into a percent.**

26) $\frac{4}{5}$

$$\frac{4}{5} \times \frac{100}{1} = (80\%)$$

27) $1\frac{1}{2}$

$$\frac{3}{2} \times \frac{100}{1} = (150\%)$$

28) $\frac{17}{10}$

$$\frac{17}{10} \times \frac{100}{1} = (170\%)$$

VIII. **Solve the following word problems.**

29) At the country fair, Jake, John, and Jim entered a pie eating contest. Jake ate $\frac{3}{5}$ of the pie, John ate 55% of his pie, and Jim ate .62 of his pie. Who ate the most of their pie?

Jake ate $\frac{3}{5}$ = 60% | John ate 55% | Jim ate 0.62 = 62% | Jim ate the most

30) Stacy spent $\frac{5}{20}$ of her money on summer clothes this year. What percent of her money did she spend?

$$\frac{5}{20} \times \frac{100}{1} = (25\%)$$

31) Chris has to walk 65% of the way to school to get to the bus stop. What fraction (in simplest form) of the trip to school is this?

$$\frac{65}{100} = \left(\frac{13}{20}\right)$$

32) There were a total of 80 entries in a photography contest. Sixty of those were color pictures. What percent of the pictures were not color?

20 pictures were not color!

$$\frac{20}{80} = \frac{1}{4} = 25\%$$ of pictures were not color.

(21) $5 - \left[2\frac{17}{15}\right]$

$= 5 - 3\frac{2}{15}$

$= 4\frac{15}{15} - 3\frac{2}{15}$

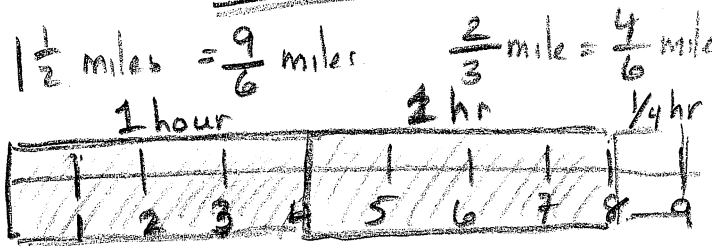$= 1\frac{13}{15}$

Eric needs to run $1\frac{13}{15}$ miles.

(22) $1\frac{1}{2}$ miles $\div \frac{2}{3}$ mile/hr.

$= \frac{3}{2} \div \frac{2}{3}$

$= \frac{3}{2} \times \frac{3}{2}$

$= \frac{9}{4}$

$= 2\frac{1}{4}$ hours

$1\frac{1}{2}$ miles $= \frac{9}{6}$ miles $\frac{2}{3}$ mile $= \frac{4}{6}$ mile

1 hour   1 hr   ¼ hr

$\frac{9}{6}$ mile

IX. Find the Greatest Common Factor of the following pairs of numbers.

33) 15, 12   (3)

15: 1, (3), 5, 15
12: 1, 2, (3), 4, 6, 12

34) 22, 44   (22)

22: 1, 2, 11, (22)
44: 1, 2, 4, 11, (22), 44

35) 48, 64   (16)

48: 1, 2, 3, 4, 6, 8, 12, (16), 24, 48
64: 1, 2, 4, 8, (16), 32, 64

36) 26, 52   (26)

X. Find the Least Common Multiple of the following pairs of numbers.

37) 3, 5   (15)

38) 4, 6   (12)

39) 10, 12   2 · 5 · 2 · 2 · 3   (60)

40) 3, 9   (9)

XI. Graph and label the following values on the number line.

41) A -5

42) B $\frac{1}{3}$

43) C $2\frac{1}{5}$

44) D $-(-.25)$

45) E $|-3|$
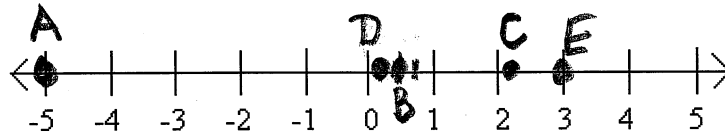
XII. Compare the following numbers using <, >, or =.

46) $\frac{3}{4} > \frac{22}{60}$

$\frac{45}{60}$ $\frac{22}{60}$

47) $\frac{2}{11} = \frac{8}{44}$

$\frac{8}{44}$

48) $\frac{2}{7} < \frac{8}{21}$

$\frac{6}{21}$ $\frac{8}{21}$

XIII. Graph the following inequalities on the number line. Be sure to label the number line.
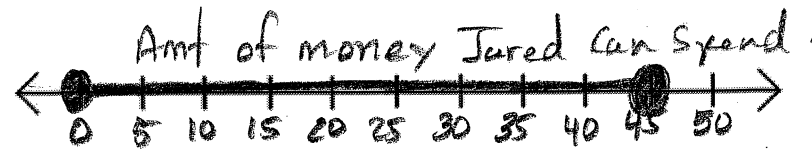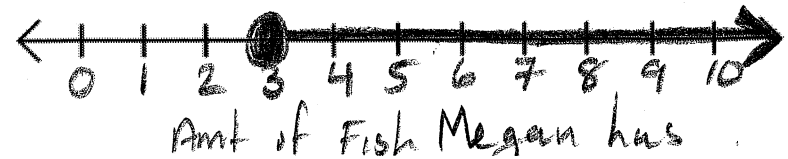
49) $x \le 12$

50) $x > -4$
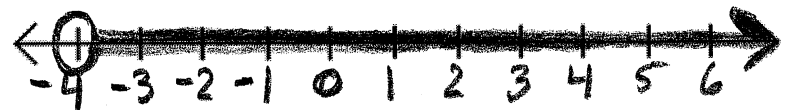
XIV. Write an inequality representing the given scenario and graph on a number line. Be sure to label the number line.

51) Jared has $45 in his wallet that he can spend

Jared can spend at most $45

52) Megan has at least 3 fish

XV. Solve the following problems.

53) One morning the temperature is -28° in Anchorage, Alaska, and 65° in Miami, Florida. How many degrees warmer was it in Miami than in Anchorage on that morning?

$$65 - (-28)$$
$$= 65 + 28 = 93$$

It is 93° Warmer in Miami

54) Denver, Colorado is called "The Mile High City" because its elevation is 5280 feet above sea level. Someone tells you that the elevation of Death Valley, California is −282 feet.

    a. Is Death Valley located above or below sea level? Explain.

Below Sea level. Sea level is zero feet and -282 means it is 282 below.

    b. How many feet higher is Denver than Death Valley?

$$5280 - (-282) = 5280 + 282 = 5652$$

Denver is 5562 Feet higher.

XVI. Write an expression for the following statements.

55) 3 more than a number $x + 3$

56) 9 less than a number $x - 9$

57) The product of a number and 7 $7x$

58) A number divided by 10 $\dfrac{x}{10}$

XVII. Simplify the following expressions.

59) $m + m + m + m$

$$4m$$

60) $3(4+1)$

$$3(5) = 15$$

61) $x + x + x + 2 + 2$

$$3x + 4$$

62) $4(2+k)$

$$8 + 4k$$

XVIII. Solve the following word problems.

63) Chichén Itzá was a Mayan city in what is now Mexico. The picture below shows El Castillo, also known as the pyramid of Kukulcán, which is a pyramid located in the ruins of Chichén Itzá.

The temple at the top of the pyramid is approximately 24 meters above the ground, and there are 91 steps leading up to the temple. How high above the ground would you be if you were standing on the 50th step?

Each step $= \dfrac{24m}{91}$ $\left\{ 50 \text{ steps} \Rightarrow 50 \times \dfrac{24m}{91} \right.$

$$= \boxed{13.187\,m}$$
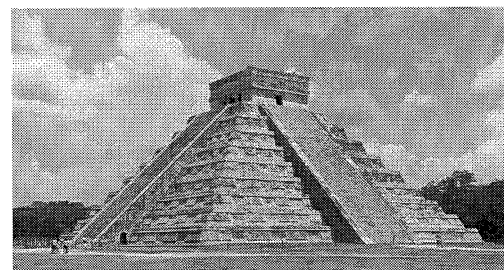
64) Tyler took the escalator to the second floor. The escalator is 12 meters long, and he rode the escalator for 30 seconds. How many meters did he travel per second?

$$12m/30sec = \boxed{0.4\,m/sec}$$

65) Mangos were being sold 8 for $10 at the farmers market. Julie said this was $1.25 per mango. Is she correct? Explain why or why not.

$$\dfrac{\$10}{8} = \dfrac{5}{4} = 1.25$$

Julie is Correct

66) Jim and Jesse each had the same amount of money. Jim spent $58 to fill the car up with gas for a road-trip. Jesse spent $37 buying snacks for the trip. Afterward, the ratio of Jim's money to Jesse's money is 1:4. How much money did each have at first?

$$\frac{x-58}{x-37} = \frac{1}{4}$$

$$4(x-58) = x-37$$
$$4x-232 = x-37$$

Cont. on next page

67) Taylor and Anya live 63 miles apart. Sometimes on a Saturday, they ride their bikes toward each other's houses and meet somewhere in between. Taylor is a very consistent rider - she finds that her speed is always very close to 12.5 miles per hour. Anya rides more slowly than Taylor, but she is working out and so she is becoming a faster rider as the weeks go by. **Work on next page**

a. On a Saturday in July, the two friends set out on their bikes at 8 am. Taylor rides at 12.5 miles per hour, and Anya rides at 5.5 miles per hour. After one hour, how far apart are they?

b. Make a table showing how far apart the two friends are after zero hours, one hour, two hours, and three hours. At what time will the two friends meet?

c. A couple of months later, on a Saturday in September, the two friends set out again on their bikes at 8 am. Taylor, as always, rides at 12.5 miles per hour. This time they meet at 11 am. How fast was Anya riding this time?
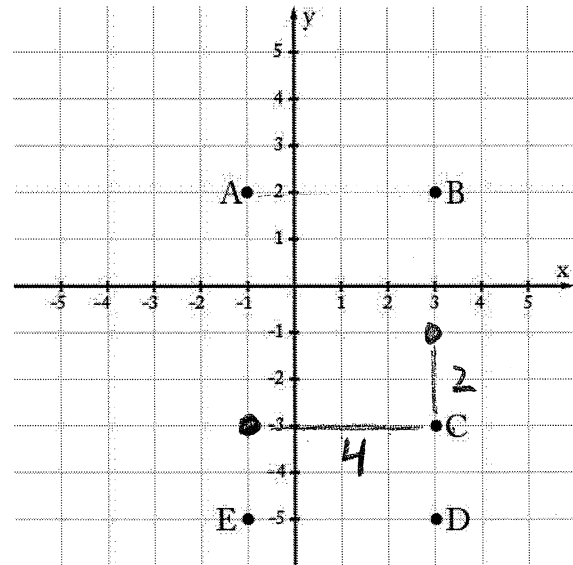
XIX. Find the distance between the following points:
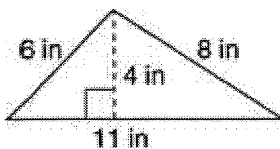
68) A and B   4

69) B and C   5

70) B and D   7

71) Which of the points shown above are 4 units away from (−1,−3) and 2 units away from (3,−1)?
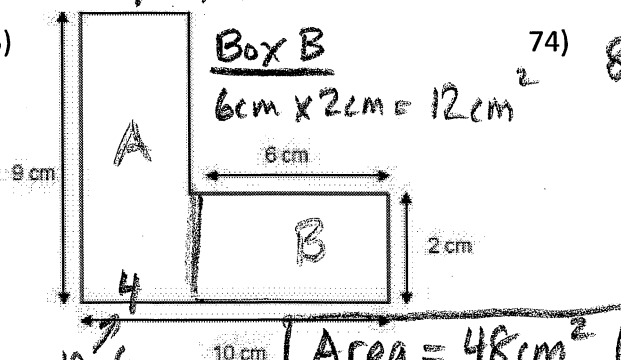
C

XX. Find the area of the following figures.

72)

$$A = \frac{1}{2}bh$$
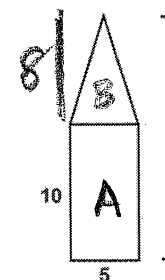$$= \frac{1}{2}(11)(4) = 22 \text{ in}^2$$

73)

Box A
4cm × 9cm = 36 cm²

Box B
6cm × 2cm = 12 cm²

Area = 48 cm²

74)

Box A
Area = 5×10
= 50

Triangle B
Area = $\frac{1}{2} \cdot 5 \cdot 8$
= 20

Area = 70

(66) $\dfrac{x-58}{x-37} = \dfrac{1}{4}$

$4(x-58) = 1(x-37)$

$4x - 232 = x - 37$

$3x - 232 = -37$

$3x = 195$

$x = 65$

They each started with $65

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(67)

(a)

Taylor 12.5mph   ← Anya 5.5mph

|———————————————————————|
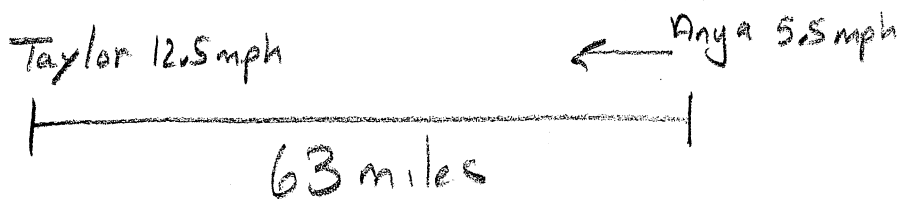
63 miles

After 1 hour: Distance apart $= 63 - (12.5) - (5.5)$

$= 63 - 18$

$= 45$ miles apart

(b)

Time Riding	Distance Apart (miles)
0	63
1	45
2	27
3	9

They get 18 miles closer every hour.

They will meet in $3\tfrac{1}{2}$ hours

(c) 63 miles in 3 hours

21 mph

Taylor still 12.5 mph

Anya: $21 - 12.5$

$= 8.5$ mph

XXI. Solve the following.

75) Many letters of the alphabet have lines of symmetry.

    a. What letters have vertical symmetry? A, H, I, M, O, T, U, V, W, X, Y

    b. What letters have horizontal symmetry? B, C, D, E, H, I, K, O, X

   c. What letters have rotational symmetry? H, I, N, O, S, X, Z

76) Alexis needs to paint the four exterior walls of a large rectangular barn. The length of the barn is 80 feet, the width is 50 feet, and the height is 30 feet. The paint costs $28 per gallon, and each gallon covers 420 square feet. How much will it cost Alexis to paint the barn? Explain your work.

Area to Paint
$(2 \times 80 \times 30) + (2 \times 50 \times 30)$
$4800 \text{ ft}^2 + 3000 \text{ ft}^2 = 7800 \text{ ft}^2$

30 ft
80 ft
30 ft

Cont. on next page

77) Two congruent squares, *ABCD* and *PQRS*, have side length 15. They overlap to form the 15 by 25 rectangle *AQRD* shown. What percent of the area of rectangle *AQRD* is shaded?
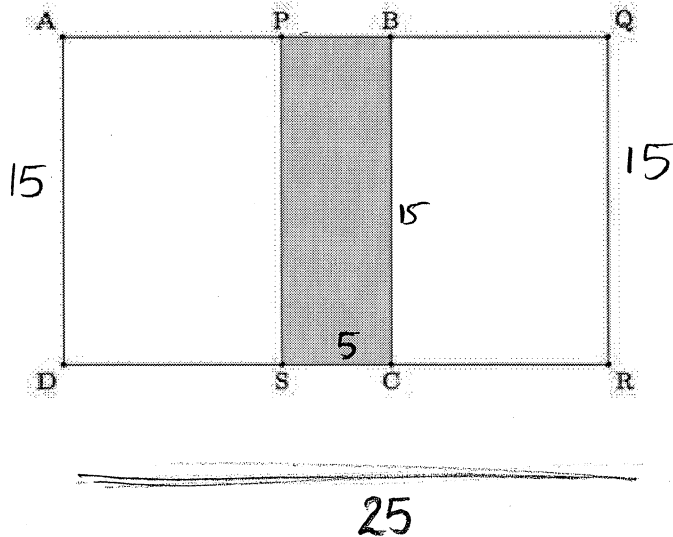
Shaded area $= 5 \times 15$
$= 75$

Rectangle area $= 15 \times 25$
$= 375$

$\frac{75}{375} = \frac{1}{5} = 20\%$

77) Leo's recipe for banana bread won't fit in his favorite pan. The batter fills the 8.5 inch by 11 inch by 1.75 inch pan to the very top, but when it bakes it spills over the side. He has another pan that is 9 inches by 9 inches by 3 inches, and from past experience he thinks he needs about an inch between the top of the batter and the rim of the pan. Should he use this pan? (Volume of a Rectangular Prism = $l \cdot w \cdot h$)

Volume of batter
$8.5 \text{ in} \times 11 \text{ in} \times 1.75 \text{ in} = 163.625 \text{ in}^3$

Volume in 2nd pan leaving 1 inch extra height
$9 \text{ in} \times 9 \text{ in} \times 2 \text{ in}$
$= 162 \text{ inches}^3$

He should..... Just a little smaller than what he wants

XXII. Convert the following.

78) 2 feet = __24__ inches   79) 3 gallons = __24__ pints   80) 4 hours = __240__ minutes

(76) Area to Paint = 7800 ft²

Each gallon Covers 420 ft²

# of Gallons needed $\frac{7800}{420}$ = 18.57

$\Rightarrow$ Needs to buy 19 gallons!

Each gallon Costs $28

TOTAL Cost : 19 × $28

= $532.00

XXIII. Solve the following.

81) Test scores for a class of 20 students are as follows:

93, 84, 97, 98, 100, 78, 86, 100, 85, 92, 72, 55, 91, 90, 75, 94, 83, 60, 81, 93

55, 60 72, 75 78 81, 83, 84, 85, 86 90, 91, 92, 93 94 95, 97, 98 100, 100,
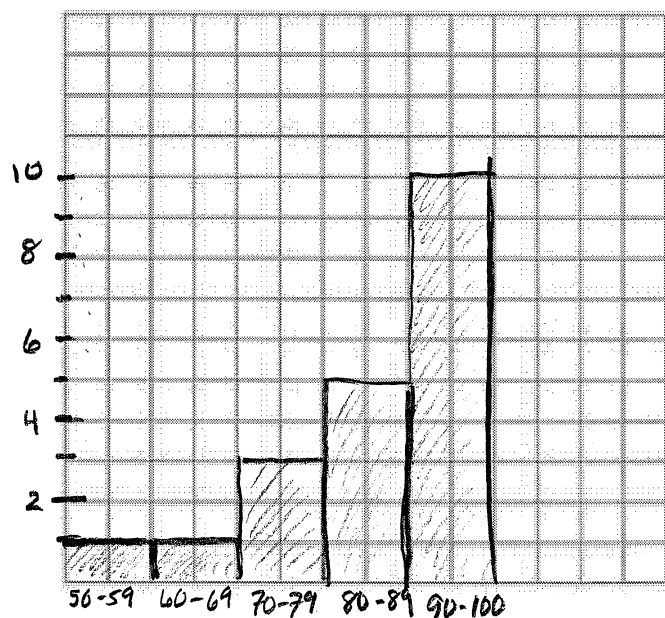
a) Create a dot plot of this data.

_____

b.) Find the mean, median, and mode for this data set.

Mean = 85.45

Median = $\frac{86+90}{2}$ = 88

mode = 100

c.) Fill in the table below and create a histogram using this data.

Data Range (Range of values for the test)	Frequency (How many test scores are in this range)
50-59	1
60-69	1
70-79	3
80-89	5
90-100	10

d. Create a box plot of the data.