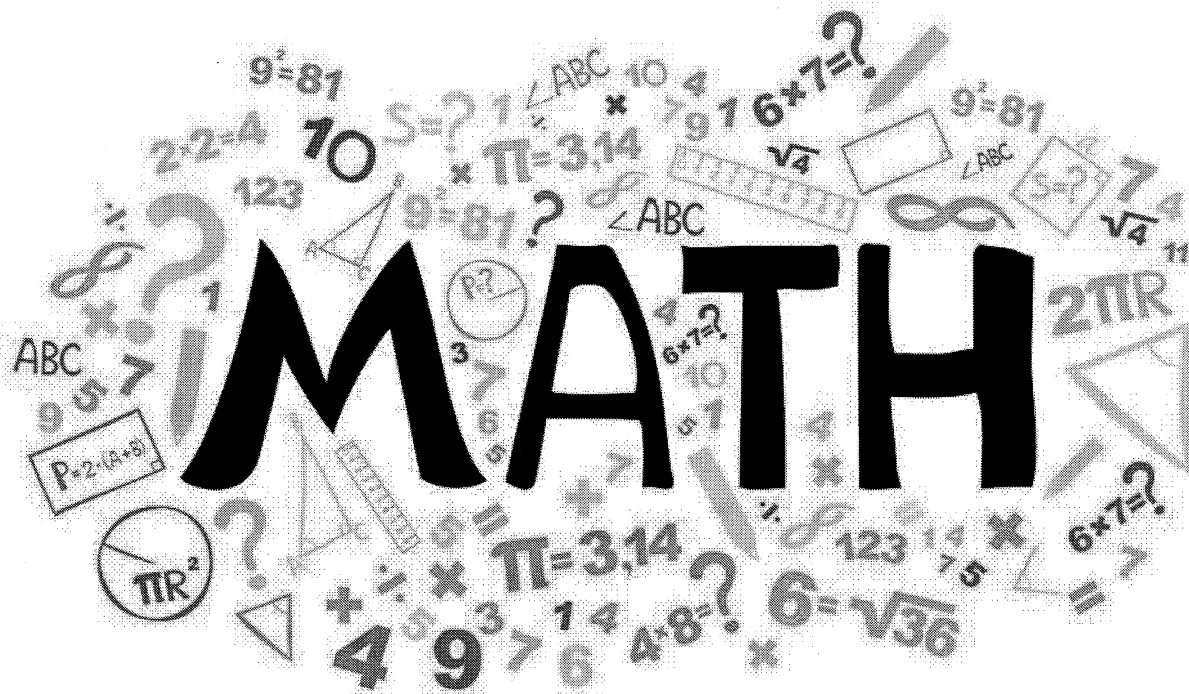


# SUMMER PACKET

## PREPARING FOR 8<sup>th</sup> GRADE MATHEMATICS



## SUFFIELD PUBLIC SCHOOLS

Supply List	Video/ App Resources	Pre-Requisites
<ul style="list-style-type: none"> <li>Pencils</li> <li>Colored Pencils</li> <li>Notebook</li> </ul>	<ul style="list-style-type: none"> <li><a href="https://www.khanacademy.org/">https://www.khanacademy.org/</a></li> <li><a href="https://mathantics.com/">https://mathantics.com/</a></li> <li><a href="https://webmath.com/">https://webmath.com/</a></li> <li><a href="https://www.mathplanet.com/">https://www.mathplanet.com/</a></li> <li><a href="http://www.math.com/">http://www.math.com/</a></li> <li><a href="https://www.ixl.com/math/algebra-1">https://www.ixl.com/math/algebra-1</a></li> <li><a href="https://www.wyzant.com">https://www.wyzant.com</a></li> <li><a href="https://purplemath.com">https://purplemath.com</a></li> </ul>	<ul style="list-style-type: none"> <li>Operations with Integers</li> <li>Operations with Fractions and Decimals.</li> <li>Simplifying algebraic expressions</li> <li>Solving simple algebraic equations</li> <li>Writing and solving rational equations.</li> <li>Evaluating algebraic expressions.</li> <li>Plotting points on a cartesian coordinate plane.</li> <li>Solving and graphing inequalities.</li> <li>Using Exponents</li> <li>Finding Perimeters, Areas, and Volumes.</li> <li>Working with Percentages.</li> <li>Solving simple word problems</li> </ul>

To Any student entering 8<sup>th</sup> Grade Mathematics in the fall –

To ensure your success in 8<sup>th</sup> Grade Math, you need to be proficient in the foundational skills and concepts that you have learned over the course of your time at Suffield Middle 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

### Math 8

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. Evaluate the following integer expressions.

1)  $-3 + 7 = 4$

2)  $-4 + 3 = -1$

3)  $6(-5) = -30$

4)  $(-3)(-7) = 21$

5)  $\frac{18}{-6} = -3$

6)  $\frac{-32}{-4} = 8$

7)  $12(-3) - 4$   
 $-36 - 4$   
 $-40$

8)  $(6+5) \cdot (8-6)$   
 $(11) \cdot (2)$   
 $22$

9)  $72 \div 3 - 5(2) + 9$   
 $24 - 10 + 9$   
 $23$

10)  $3 \cdot 14(10-8) - 60$   
 $3 \cdot 14(2) - 60$   
 $84 - 60$   
 $24$

#### II. Evaluate the following rational expressions.

11)  $-\frac{3}{4} + \frac{5}{6}$   
 $-\frac{9}{12} + \frac{10}{12}$   
 $\frac{1}{12}$

12)  $1\frac{1}{8} - \frac{1}{2}$   
 $\frac{9}{8} - \frac{4}{8}$   
 $\frac{5}{8}$

13)  $\frac{4}{5} \cdot \frac{10}{12}$   
 $\frac{40}{60}$   
 $\frac{2}{3}$

14)  $-\frac{9}{10} \div \frac{3}{5}$   
 $-\frac{9}{10} \times \frac{5}{3}$   
 $-\frac{45}{30}$   
 $-\frac{3}{2}$

15)  $4.901 + 2.93$

16)  $6.02 - 3.87$

17)  $(-7.1)(9.9)$

18)  $18.124 \div 3$

#### III. Rewrite the fractions below as decimals and percentages.

19)  $\frac{3}{4}$   
 $0.75$   
 $75\%$

20)  $\frac{7}{10}$   
 $0.7$   
 $70\%$

21)  $\frac{34}{100}$   
 $0.34$   
 $34\%$

22)  $\frac{5}{2}$   
 $2.5$   
 $250\%$

#### IV. Rewrite the decimals below as fractions in simplest form.

23)  $\overline{0.33}$   
 $\frac{1}{3}$

24)  $.62$   
 $\frac{62}{100}$   
 $\frac{31}{50}$

25)  $1.8$   
 $\frac{18}{10}$   
 $\frac{9}{5}$

26)  $2.25$   
 $\frac{225}{100}$   
 $\frac{9}{4}$

V. Solve the following proportions.

$$27) \frac{8}{9} = \frac{x}{27} \quad x=24$$

$$8x = 9(27)$$

$$28) \frac{1}{4} = \frac{5}{y} \quad y=20$$

$$y = 4(5)$$

$$29) \frac{1}{m} = \frac{8}{24}$$

$$8m = 1(24)$$

$$m = 3$$

$$30) \frac{n}{3} = \frac{10}{15}$$

$$15n = 3(10)$$

$$15n = 30$$

$$n = 2$$

VI. Simplify the following expressions.

$$31) 3(x+8)$$

$$3x+24$$

$$32) -5(x-4)$$

$$-5x+20$$

$$33) 7x-9-8x+4$$

$$-x-5$$

$$34) 6x+2(x-10)$$

$$6x+2x-20$$

$$8x-20$$

VII. Solve for the missing variable.

$$35) 2x = -12$$

$$x = -6$$

$$36) x+4 = 26$$

$$x = 22$$

$$37) \frac{x}{9} = -5$$

$$x = -45$$

$$38) 3x-4 = 8$$

$$3x = 12$$

$$x = 4$$

$$39) 10 = -2x+6$$

$$4 = -2x$$

$$x = -2$$

$$40) \frac{x}{11} + 3 = -2$$

$$\frac{x}{11} = -5$$

$$x = -55$$

$$41) \frac{2x}{-4} - 5 = 2$$

$$\frac{2x}{-4} = 7$$

$$2x = -28$$

$$x = -14$$

$$42) \frac{3x+2}{7} = 2$$

$$3x+2 = 14$$

$$3x = 12$$

$$x = 4$$

VIII. Complete the following tables.

$$43) y = 5x + 2$$

$$44) a = 4b - 3$$

x	$5x+2$	y		b	$4b-3$	a
3	$5(3)+2$	17		3	$4(3)-3$	9
6	$5(6)+2$	32		4	$4(4)-3$	13
9	$5(9)+2$	47		5	$4(5)-3$	17
12	$5(12)+2$	62		6	$4(6)-3$	21

**IX. Write an algebraic expression for each phrase.**

45) 7 less than m  $m - 7$

46) the quotient of 3 and y  $\frac{3}{y}$

47) 3 times as many marbles as Bob  $3x$   $x = \# \text{ of marbles Bob has}$

**X. Write an inequality for each phrase.**

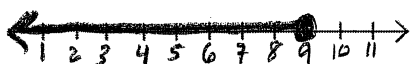
48) The sum of a number and 6 is at least 15.  $x + 6 \geq 15$

49) 24 divided by some number is less than 7.  $\frac{24}{x} < 7$

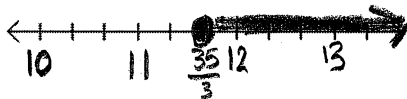
50) Five dollars less than two times Chris's pay is at most \$124.  $2C - 5 \leq 124$   $C = \text{Chris's pay}$

**XI. Solve the inequality and graph the solution.**

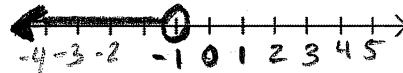
51)  $y + 5 \leq 14$   
 $y \leq 9$



52)  $3m + 1 \geq 36$   
 $3m \geq 35$   $m \geq \frac{35}{3}$



53)  $-4x + 2 > 6$   
 $-4x > 4$   $x < -1$



**XII. Write the following in exponential form.**

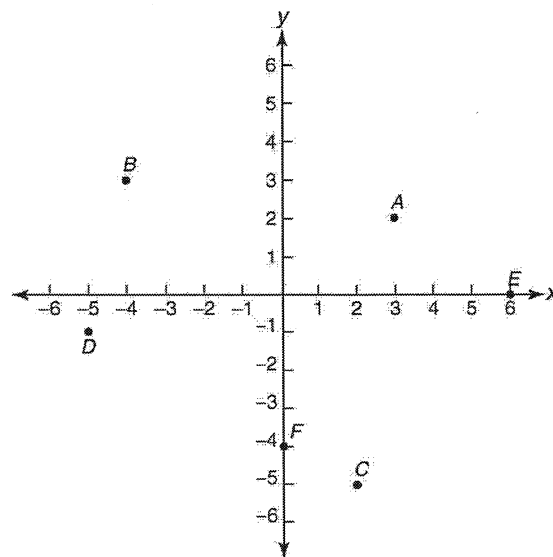
54)  $9 \cdot 9 \cdot 9 \cdot 9 \cdot 9$   
 $9^5$

55)  $12 \cdot 12 \cdot 12$   
 $12^3$

56) 1,000,000 as a power of 10  
 $10^6$

**XIII. Name the ordered pair for each point graphed at the right and identify the quadrant in which the point lies.**

		Coordinate	Quadrant
57)	A	( <u>3</u> , <u>2</u> )	<u>I</u>
58)	B	( <u>-4</u> , <u>3</u> )	<u>II</u>
59)	C	( <u>2</u> , <u>-5</u> )	<u>IV</u>
60)	D	( <u>-5</u> , <u>-1</u> )	<u>III</u>
61)	E	( <u>6</u> , <u>0</u> )	_____
62)	F	( <u>0</u> , <u>-4</u> )	_____



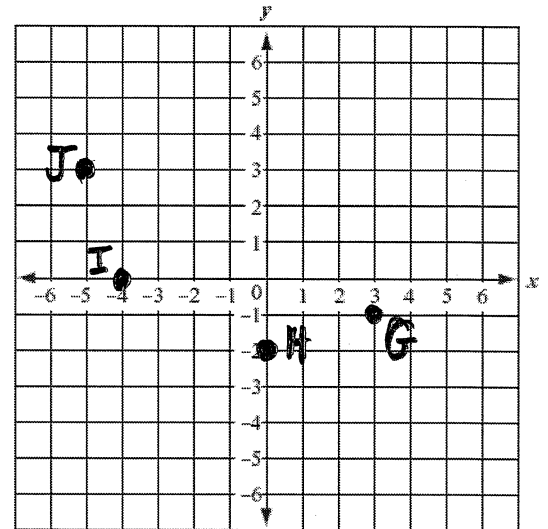
**XIV. Graph and label each point in the coordinate plane.**

64) G (3, -1)

65) H (0, -2)

66) I (-4, 0)

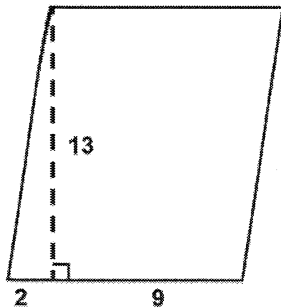
67) J (-5, 3)



All of the following exercises can be completed with the use of a calculator.

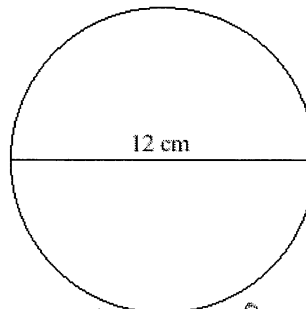
**XV. Find the area of the following figures.**

68)  $A = bh$



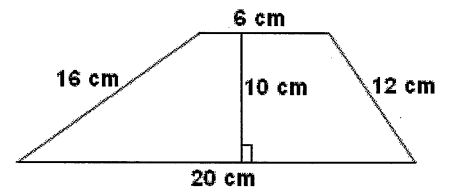
Area =  $bh$   
 $= 11(13)$   
 $= 143$

69)  $A = \pi r^2$



Area =  $\pi r^2$   
 $= \pi (12\text{ cm})^2$   
 $= 36\pi \text{ cm}^2$  or  $113.097 \text{ cm}^2$

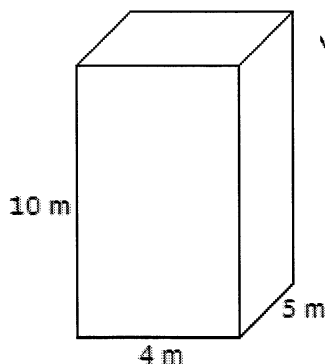
70)  $A = \frac{1}{2} h (b_1 + b_2)$



Area =  $\frac{1}{2} (10\text{ cm}) (6\text{ cm} + 20\text{ cm})$   
 $= \frac{1}{2} (10\text{ cm}) (26\text{ cm})$   
 $= 130 \text{ cm}^2$

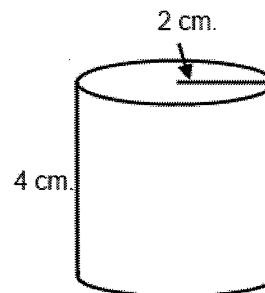
**XVI. Find the volume of the following figures.**

71)  $V = Bh$  or  $V = lwh$



Volume =  $lwh$   
 $= (5\text{ m})(4\text{ m})(10\text{ m})$   
 $= 200 \text{ m}^3$

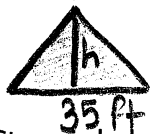
72)  $V = Bh$  or  $V = \pi r^2 h$



Volume =  $\pi r^2 h$   
 $= \pi (2\text{ cm})^2 (4\text{ cm})$   
 $= \pi (4\text{ cm}^2) (4\text{ cm})$   
 $= 16\pi \text{ cm}^3$   
 or  $50.265 \text{ cm}^3$

**XVII. Solve the following word problems.**

- 71) A garden in the shape of a triangle has an area of 875 square feet. The garden is 35 feet long. Determine the width of the garden at its widest point.  $A = \frac{1}{2}bh$



$$A = 875 \text{ ft}^2$$

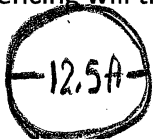
$$\text{Area} = \frac{1}{2}bh$$

$$875 = \frac{1}{2}(35)(h)$$

$$1750 = 35h$$

$$h = 50 \text{ feet}$$

- 72) Steve is helping his mom make a circular flower bed. The diameter of the flower bed is 12.5 feet. How much fencing will they need to buy?  $C = \pi d$  or  $C = 2\pi r$



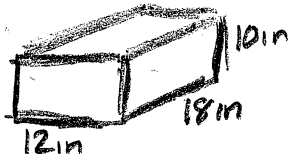
$$\text{Fencing (Circumference)} = \pi d$$

$$= \pi(12.5 \text{ ft})$$

$$12.5 \pi \text{ feet}$$

$$\text{or } 39.2699 \text{ feet}$$

- 73) A packaging company needs to order cardboard to make boxes 18 inches long, 12 inches wide, and 10 inches high. How much cardboard will be needed for each box if there is no overlap in the construction?  $SA = 2B + ph$



$$SA = 2(\text{Base Area}) + (\text{perimeter} \times \text{height})$$

$$= 2(18 \text{ in} \times 12 \text{ in}) + ((2(18) + 2(12)) \cdot 10 \text{ in})$$

$$= 2(216 \text{ in}^2) + ((36 + 24) \cdot 10 \text{ in})$$

$$432 \text{ in}^2 + 600 \text{ in}^2$$

$$= 1032 \text{ in}^2$$

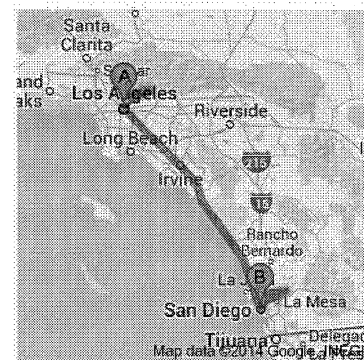
- 74) On a map, the distance from Los Angeles to San Diego is 6.35 cm. The scale is 1 cm = 20 miles. What is the actual distance?

$$\frac{1 \text{ cm}}{20 \text{ miles}} = \frac{6.35 \text{ cm}}{x}$$

$$x = 20(6.35)$$

$$x = 127 \text{ miles}$$

The distance between  
LA and San Diego  
is 127 miles



- 75) Lexie is making a model of the Empire State Building. The scale of her model will be 1 inch = 9 feet. The needle at the top is 31.5 feet tall. How big should the needle be on the model?

$$\frac{1 \text{ in}}{9 \text{ feet}} = \frac{x \text{ in}}{31.5 \text{ feet}}$$

$$\Rightarrow 9x = 31.5 \text{ ft}$$

$$x = 3.5$$

The Model needle should  
be 3.5 inches  
tall

- 76) The scale drawing of an automobile has a scale of 1 inch =  $\frac{1}{2}$  foot. The actual width of the car is 8 feet. What is the width on the scale drawing?

$$\frac{1 \text{ inch}}{\frac{1}{2} \text{ foot}} = \frac{x}{8 \text{ feet}}$$

$$\Rightarrow \frac{1}{2}x = 8$$

$$x = 16$$

The model should be  
16 inches long

- 77) Lois has  $3\frac{1}{3}$  pounds of butter. She uses  $\frac{3}{4}$  pound in a recipe. How much does she have left?

$$3\frac{1}{3} - \frac{3}{4} \Rightarrow 3\frac{4}{12} - \frac{9}{12} \Rightarrow 2\frac{16}{12} - \frac{9}{12} = 2\frac{7}{12}$$

She has  $2\frac{7}{12}$  pounds left

- 78) In baseball, David has 10 hits out of 14 at bats. Adam has 15 hits out of 21 at bats. Who was a better hitter? Explain.

$$\frac{10}{14}$$

$$\frac{5}{7}$$

$$\frac{15}{21}$$

$$\frac{5}{7}$$

They have the same batting  
average

79) Pam typed 325 words in 25 minutes. How many words did she type per minute?

$$\frac{325}{25} = \frac{13}{1} \quad \text{She types 13 words/minute.}$$

80) There are two classrooms with the same ratio of girls to boys. Classroom A has 5 boys for every 4 girls. Classroom B has a total of 15 boys. How many girls are in Classroom B?

$$\frac{5 \text{ boys}}{4 \text{ Girls}} = \frac{15 \text{ boys}}{x \text{ Girls}} \Rightarrow 4(15) = 5x \quad x = 12 \quad \text{12 Girls}$$

81) You have \$50.86 in your wallet and want to buy as many notebooks as you can with your money for school. Each notebook costs \$3.99. How many can you purchase? Write an equation and solve.

$$x = \# \text{ of notebooks} \quad 3.99x = 50.86 \quad x = 12.74 \quad \text{you can buy 12 notebooks}$$

82) You open a bank account with a deposit of \$2000. After a week, you decide to withdraw \$120. The following week you deposit \$230. How much money do you have in your account at the end of the two weeks?

$$2000 - 120 + 230 = 2110$$

83) You have 20 feet of fabric to use for making party favors. Each party favor requires  $\frac{3}{4}$  of a foot of fabric. How many favors can you make using the fabric that you have? Write an equation and solve.

$$\left(\frac{3}{4} \text{ of a foot of fabric}\right) \cdot (\# \text{ of favors}) = 20 \text{ feet} \Rightarrow \frac{20}{\frac{3}{4}} = x \quad \text{you can make 26 favors}$$

$$\frac{3}{4}x = 20 \quad 20 \times \frac{4}{3} = x = \frac{80}{3}$$

84) The speed limit on highways in Florida is 70 miles per hour. Write and solve an inequality to find how long it will take you to travel the 105 miles from Orlando to St. Augustine if you travel at or below the speed limit.

$$\text{Time}(t) \leq \frac{105}{70} \Rightarrow t \leq \frac{3}{2} \text{ hours}$$

85) You have \$80. Jeans cost \$29 and shirts cost \$12. Mom told you to buy one pair of jeans and use the rest of the money to buy shirts. Use this information to write and solve an inequality describing how many shirts you can buy.

$$29 + 12x \leq 80 \Rightarrow 12x \leq 51 \quad x \leq 4.25 \quad \text{4 shirts or less}$$

Jeans + 12(number of T-shirts) ≤ 80

86) You have joined a gym for an introductory fee of \$10 plus a membership fee of \$5 per month. How many months have you been a member if you have spent \$90? Write an equation and solve.

$$\$10 + 5x = 90 \quad (x = \# \text{ of months}) \Rightarrow x = 16 \quad \text{member for 16 months}$$

$$5x = 80$$

87) Your iPod costs \$100 when you first bought it. If you purchase 200 songs at \$1.20 each, find the total amount your iPod is worth (including the iPod and the songs on it).

$$\$100 + 200(1.20) = \$340$$

$$\$100 + \$240 = \$340$$

88) Justin is buying a cell phone that has a regular price of \$149. The cell phone is on sale for 15% off the regular price. What will be the sale price?

$$15\% \text{ off} \Rightarrow \text{Cost is } 85\% \text{ regular Price}$$

$$0.85(\$149) = \$126.65$$



89) You want to buy a new sweater. The regular price was \$48. The sale price was \$34. What was the percent discount to the nearest percent?

\$14 off price

$$\frac{14}{48} = 0.291666$$

29% Discount

90) Jeremy wants to buy a skateboard but does not know if he has enough money. The price of the skateboard is \$85 with a sales tax of 6%. What will be the total cost of the skateboard including the tax?

$$\text{Tax} = 0.06 \times 85 = \$5.10$$

$$\text{TOTAL Cost} = \$85 + \$5.10 = \$90.10$$

91) Blake bought two magazines for \$4.95 each. If the sales tax was 6.75%, what was the total amount that he paid for the magazines?

$$\text{Cost} = \$4.95 \times 2 = \$9.90$$

$$\text{Sales tax} = 0.0675 \times 9.90 = 0.66825 \approx 0.67$$

$$\text{TOTAL} = 9.90 + 0.67 = \$10.57$$

92) There are 24 skittles in a package. Of these, 8 are red, 2 are yellow, 4 are green, and the rest are purple. What is the probability that you will get a purple skittle if you reach into the bag and pull one out at random?

10 purple skittles

$$\text{Probability of Pulling a purple skittle} = \frac{10}{24} = \frac{5}{12}$$

93) What is the probability that you will roll a 4 three times in a row on a six-sided die?

$$\text{Probability of rolling a 4: } \frac{1}{6} \quad \text{Three fours in a row: } \frac{1}{6} \cdot \frac{1}{6} \cdot \frac{1}{6} = \frac{1}{216}$$

94) In a bucket where you keep your change, you have 23 quarters, 18 dimes, 44 pennies, and 17 nickels. What is the probability that you will take out two quarters in a row?

$$\text{TOTAL COINS} \rightarrow 23 + 18 + 44 + 17 = 102$$

$$\text{Probability of Picking a Quarter} = \frac{23}{102}$$

$$\text{Probability of Picking a Second Quarter} = \frac{22}{101}$$

$$\text{Probability of 2 Quarters in a row: } \frac{23}{102} \cdot \frac{22}{101} = \frac{506}{10302}$$