RICAS Grade 8
Approved Supplemental Mathematics Reference Sheet*

General Problem Solving Strategies

1. Read/reread the problem for understanding.
2. Identify what the question is asking.
3. Make a plan to solve the problem. (Choose at least one strategy.)
   - Draw a picture.
   - Create a table, chart, or list.
   - Look for a pattern.
   - Work backwards.
   - Write a number sentence or an equation.
4. Solve the problem.
5. Reread the problem

Order of Operations Symbols

PEMDAS

1. **P**arentheses (brackets, etc.)
2. **E**xponents
3. **M**ultiplication or **D**ivision (left to right)
4. **A**ddition or **S**ubtraction (left to right)

GEMA

1. **G**rouping
2. **E**xponents
3. **M**ultiplicative operations (multiplication or division- left to right)
4. **A**dditive operations (addition or subtraction- left to right

Symbols

- $>$ is greater than
- $<$ is less than
- $=$ is equal to
- $|\ xx\ |$ is absolute value of xx
- $\geq$ is greater than or equal to
- $\leq$ is less than or equal to

Divisibility Rules

2	If the last digit is even
3	If the sum of the digits can be divided by 3
5	If the last digit is 0 or 5
6	If the number is divisible by both 2 and 3
9	If the sum of the digits can be divided by 9
10	If the last digit is 0

Fractions

- $\frac{a}{b} + \frac{c}{d} = \frac{ad + bc}{bd}$
- $\frac{a}{b} - \frac{c}{d} = \frac{ad - bc}{bd}$
- $\frac{a}{b} \bullet \frac{c}{d} = \frac{ac}{bd}$
- $\frac{a}{b} \div \frac{c}{d} = \frac{ad}{bc}$

Properties

- $a(b + c) = ab + ac$
- $a + (b + c) = (a + b) + c$
- $a \bullet (b \bullet c) = (a \bullet b) \bullet c$
- $a \bullet b = b \bullet a$
- $a + b = b + a$
- $a - (-b) = a + b$
- $a + (-b) = a - b$

Statistics

Probability

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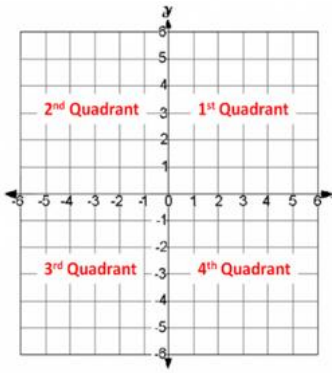
- me**A**n-Average
- me**DI**an-Middle
- **MO**de-Most Often
- **R**ang**E-** Least to Greatest

$$P = \frac{favorable\ outcomes}{possible\ outcomes}$$

Coordinate Plane

- $Ax + By = C$
- Slope or Rate of Change $\left(m\right) = \frac{y_2 - y_1}{x_2 - x_1}$
  $= \frac{Rise}{Run}$
- $y = mx + b$
- $y - y_1 = m(x - x_1)$



Place Value

Whole Numbers							Decimals	
Hundred-thousands	Ten-thousands	Thousands	Hundreds	Tens	Ones	.	Tenths	Hundredths

Transformations

- ro**T**ation -Turn
- re**FL**ection -Flip
- tran**SL**ation-Slide

Percentages and Proportions

- $\frac{is}{of} = \frac{\%}{100}$
- $x\% = \frac{x}{100}$
- $\frac{a}{b} = \frac{c}{d}$ $then\ ad = bc$

Hundreds Chart

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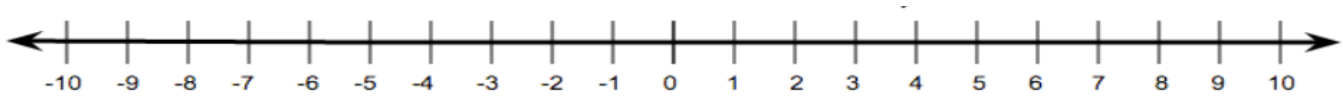
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

91	92	93	94	95	96	97	98	99	100
81	82	83	84	85	86	87	88	89	90
71	72	73	74	75	76	77	78	79	80
61	62	63	64	65	66	67	68	69	70
51	52	53	54	55	56	57	58	59	60
41	42	43	44	45	46	47	48	49	50
31	32	33	34	35	36	37	38	39	40
21	22	23	24	25	26	27	28	29	30
11	12	13	14	15	16	17	18	19	20
1	2	3	4	5	6	7	8	9	10

Geometry and Measurement

- l = length
- w = width
- h = height
- s = length of a side
- b = length of the base
- d = diameter
- A = area
- B = area of the base
- P = perimeter
- C = circumference
- r = radius

Number Line