**MCAS Grade 8**

**Approved Supplemental Mathematics Reference Sheet**

(For use by students on the MCAS Mathematics test who have this accommodation)

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| **General problem-solving strategies** | **Symbols** |
| * Reread question for clarity
* Circle or highlight key terms
* Calculate and solve
* Circle my answer
* See if my answer makes sense
 | * $>$ is greater than
* $<$ is less than
* $=$ is equal to
* |absolute value|
* ≤ is less than or equal to
* ≥ is greater than or equal to
 |
| **Place Value** | **Divisibility Rules** |
|

|  |  |  |
| --- | --- | --- |
| Whole Numbers |  | Decimals |
| Ht | Tt | Th | H | T | O | . | T | H | Th |
|  |  |  |  |  |  |  |  |  |  |

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|  |  |
| --- | --- |
| 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 |

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| **Volume (*V*  ) Formulas**  | **Area (*A* ) Formulas** |
| Cube... $V=s^{3}$ ($s=length of an edge$)Sphere... $V=\frac{4 }{3} πr^{3}$ ($r=radius$)Cone…$ V=\frac{1 }{3} πr^{2}h$ Right Circular Cylinder…$ V=πr^{2}h$Right prism… $V=Bh$ ($B=area of base;h=height$) | Square… $A=s^{2} $ ($s$ = length of a side)Rectangle... $A=bh$ ($b=length of base;h=height$) OR $A=lw$ $(l=length;w=width$)Circle… $A=πr^{2}$Parallelogram... $A=bh$ Triangle... $A=\frac{1}{2}bh$ Trapezoid... $A=\frac{1}{2}h( b\_{1}+b\_{2} )$ |
| **Circle Formulas** |
| Area.... $A=πr^{2}$ ($r=radius$)Circumference…$C=2πr$  OR $C=πd$ $(d=diameter)$ |

|  |  |
| --- | --- |
| **Pythagorean Theorem** | **Total Surface Area (*SA* ) Formulas** |
|   $a^{2}+ b^{2}=c^{2}$ $$a$$$$c$$$$b$$ | Right Rectangular Prism… $SA=2\left(lw\right) +2\left(hw\right)+ 2(lh)$ ($l=length;w=width;h=height$)Right Circular Cylinder… $SA=2πr^{2} +2πrh$ Sphere… $SA=4πr^{2}$  |
| **Devices and Operations** | **Percentages and Proportions** |
| * PEMDAS
* Same sign – sum
* Different sign - difference
 | * $\frac{is}{of}=\frac{\%}{100}$
* $\frac{a}{b}= \frac{c}{d} then ad=bc$

  |
| **Transformations** | **Coordinate Plane***y* |
| * ro**T**ation
* re**FL**ection
* tran**SL**ation
 | * $Ax+By=C$

*x*IIIIVIII* $m=\frac{y\_{2}-y\_{1}}{x\_{2}-x\_{1}}$
* $y=mx+b$
* $y-y \_{1}= m(x-x\_{1})$
 |
| **Statistics** | **Probability** |
| * me**A**n
* **MO**de
* me**DI**an
* **R**ang**E**
 | $$P=\frac{favorable outcomes}{possible outcomes}$$ |

|  |  |
| --- | --- |
| **Properties** | **Fractions** |
| * $a\left(b+c\right)=ab+ac$
* $a+\left(b+c\right)=\left(a+b\right)+ c$
* $a ⦁\left(b⦁c\right)=\left(a⦁b\right)⦁ c$
* $a ⦁ b=b ⦁ a$
* $a+b=b+a $
 | * $\frac{a}{b}+\frac{c}{d}=\frac{ad+bc}{bd}$
* $\frac{a}{b}-\frac{c}{d}=\frac{ad-bc}{bd}$
* $\frac{a}{b}·\frac{c}{d}=\frac{ac}{bd}$
* $\frac{a}{b}÷\frac{c}{d}=\frac{ad}{bc} $
 |
| **Number Table** | **Number Line** |
|

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 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 |

 | Number line |
| **Conversions** |
| 1 cup = 8 fluid ounces1 pint = 2 cups1 quart = 2 pints1 gallon = 4 quarts1 gallon ≈ 3.785 liters1 liter ≈ 0.264 gallon1 liter = 1000 cubic centimeters | 1 inch = 2.54 centimeters1 meter ≈ 39.37 inches1 mile = 5280 feet1 mile = 1760 yards1 mile ≈ 1.609 kilometers1 kilometer ≈ 0.62 mile | 1 pound = 16 ounces1 pound ≈ 0.454 kilogram1 kilogram ≈ 2.2 pounds1 ton = 2000 pounds |