5 District of Columbia DC CAPE

Grade 8

Math Practice Test

Proven Practice for Top Scores with Detailed Explanations







Real Practice. Real Results

Practice Smart. Score Higher.

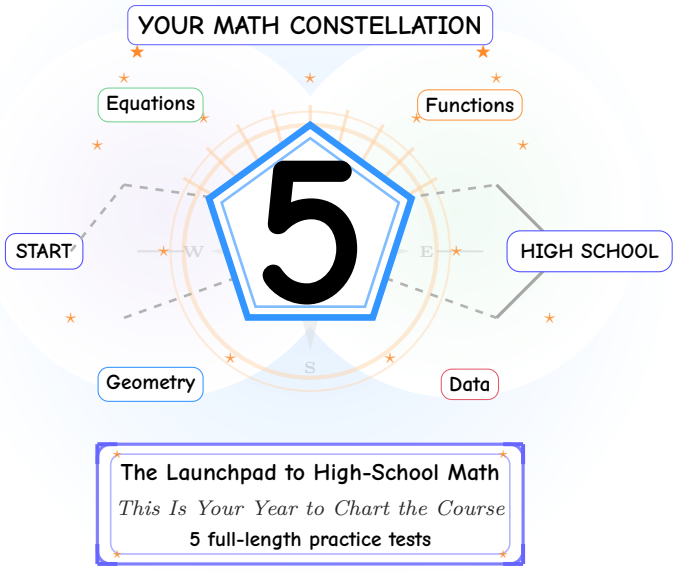
Small Steps, Big Gains!

Practice Master Achieve

Reza Nazari

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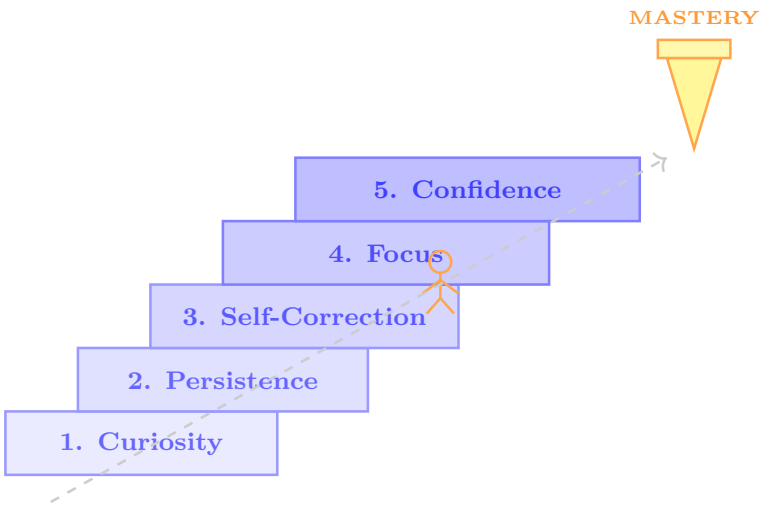
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Think Like a Mathematician

Five Habits That Separate Good from Great



Reframe Your Inner Dialogue

Instead of: "I cannot do this problem."

Try: "I cannot do this problem *yet*. What is the first step I can identify?"

Neuroscience shows that when you treat a mistake as information rather than as a verdict, your brain literally rewires itself to perform better on the next attempt.

The Five Habits of Successful Math Students

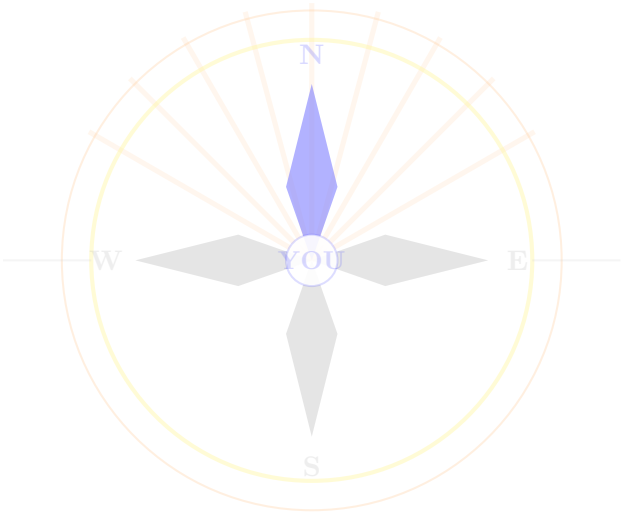
1. **Stay Curious:** Before you calculate, ask *why* the problem is set up the way it is. Curiosity transforms a tedious exercise into a puzzle worth solving. Students who ask "What would happen if. . . ?" consistently outperform those who simply follow steps.

2. **Persist Through Difficulty:** Your brain strengthens its neural connections every time you wrestle with a hard problem—even if you do not solve it on the first try. The effort itself is where the learning occurs. Giving up after thirty seconds denies your brain the workout it needs.

3. **Correct Yourself Immediately:** When you review a missed problem, do not just read the answer. Rework it from scratch until you can complete it independently and without any hints. That single act of self-correction is more valuable than getting ten easy problems right.

4. **Focus on One Problem at a Time:** On test day, the only question that matters is the one in front of you. Do not replay the last question or worry about how many remain. Channel your full concentration into the present item, finish it, and then move forward.

5. **Build Confidence Through Evidence:** Each practice test you complete in this workbook is proof that you can handle DC CAPE-level material. By the time you reach Test 5, you will have solved hundreds of problems—and that track record is the most powerful source of confidence there is.



Grade 8 Math Quick Review

Essential formulas and concepts at a glance

1. LINEAR EQUATIONS & SLOPE

Slope-Intercept Form: $y = mx + b$

m = slope, b = y-intercept

Example: $y = -2x + 5$

slope $= -2$, y-intercept $= (0,\ 5)$

Slope Formula: $m = \dfrac{y_2 - y_1}{x_2 - x_1}$

Example: $(1,\ 4)$ and $(5,\ -4)$

$m = \dfrac{-4-4}{5-1} = \dfrac{-8}{4} = -2$

Parallel Lines: same slope

Perpendicular Lines: slopes multiply to -1

If $m_1 = \frac{3}{4}$, then $m_2 = -\frac{4}{3}$

Standard Form: $Ax + By = C$

Point-Slope Form: $y - y_1 = m(x - x_1)$

Horizontal Line: $y = k$ (slope $= 0$)

Vertical Line: $x = k$ (slope is undefined)

2. TRANSFORMATIONS

Translation	$(x,\ y) \to (x + h,\ y + k)$	Slide h units right, k units up
Reflection (x-axis)	$(x,\ y) \to (x,\ -y)$	Flip over the x-axis
Reflection (y-axis)	$(x,\ y) \to (-x,\ y)$	Flip over the y-axis
Rotation $90°$ CCW	$(x,\ y) \to (-y,\ x)$	Quarter-turn counterclockwise
Rotation $180°$	$(x,\ y) \to (-x,\ -y)$	Half-turn about the origin
Rotation $270°$ CCW	$(x,\ y) \to (y,\ -x)$	Three-quarter turn CCW
Dilation (center O)	$(x,\ y) \to (kx,\ ky)$	Scale factor k; $k > 1$ enlarges



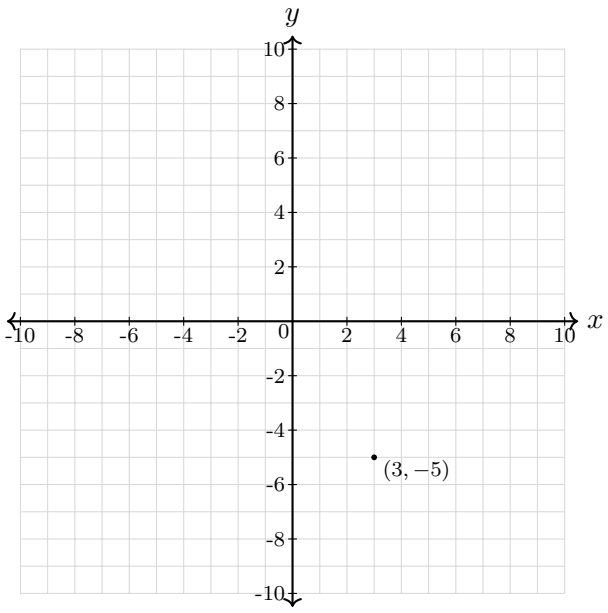
Write clearly
Neat work helps

Scan Me

1) Which set of ordered pairs represents a function?

☐ A. $\{(-15, 10), (-15, 25), (-15, 40)\}$
☐ B. $\{(5, -20), (35, 10), (5, 50)\}$
☐ C. $\{(-25, 15), (15, -35), (45, -55)\}$
☐ D. $\{(-35, 20), (25, -40), (-35, 55)\}$

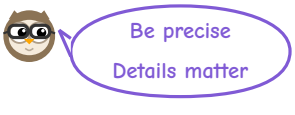
2) A line passes through the points $(3, -5)$ and $(-2, k)$. If the slope of the line is $\frac{3}{5}$, what is the value of k?



☐ A. -8
☐ B. -7
☐ C. -2
☐ D. 1

3) What is the equivalent temperature of $35℃$ in Fahrenheit?
Use the formula $F = \frac{9}{5}C + 32$.

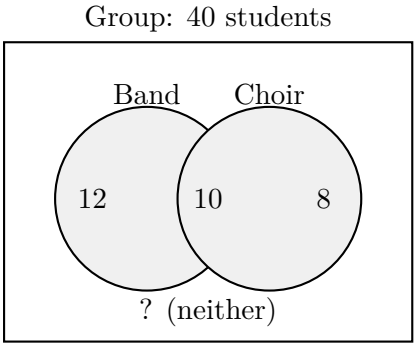
☐ A. $90°F$
☐ B. $93°F$
☐ C. $95°F$
☐ D. $100°F$



4) A water tank contains 500 gallons of water. Water is being drained from the tank at a constant rate of 25 gallons per hour. Which equation represents the amount of water w, in gallons, remaining in the tank after h hours?

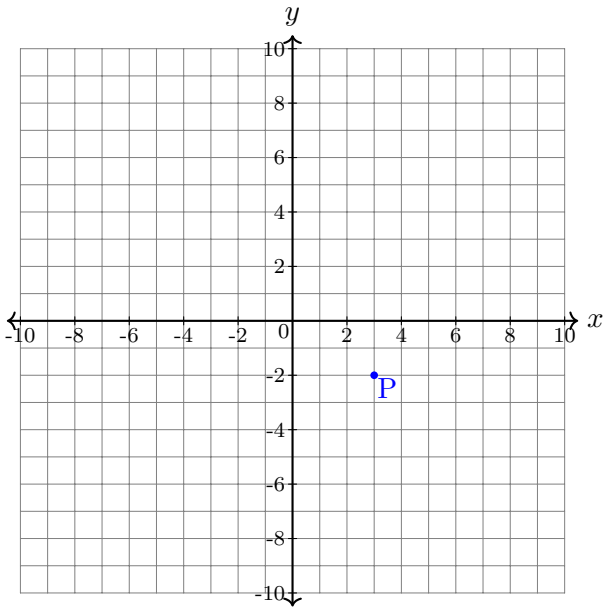
☐ A. $w = 25h + 500$
☐ B. $w = 500h - 25$
☐ C. $w = -25h + 500$
☐ D. $w = 25h - 500$

5) In a group of 40 students, 22 are in band, 18 are in choir, and 10 are in both activities. How many students are in neither band nor choir?



☐ A. 6
☐ B. 8
☐ C. 10
☐ D. 12

6) A point P has coordinates $(3, -2)$. What are the coordinates of point P' after a reflection across the x-axis?



Record your answer in the space provided.

7) Solve for x: $-2x + 1 = -4x - 11$

Record your answer in the space provided.