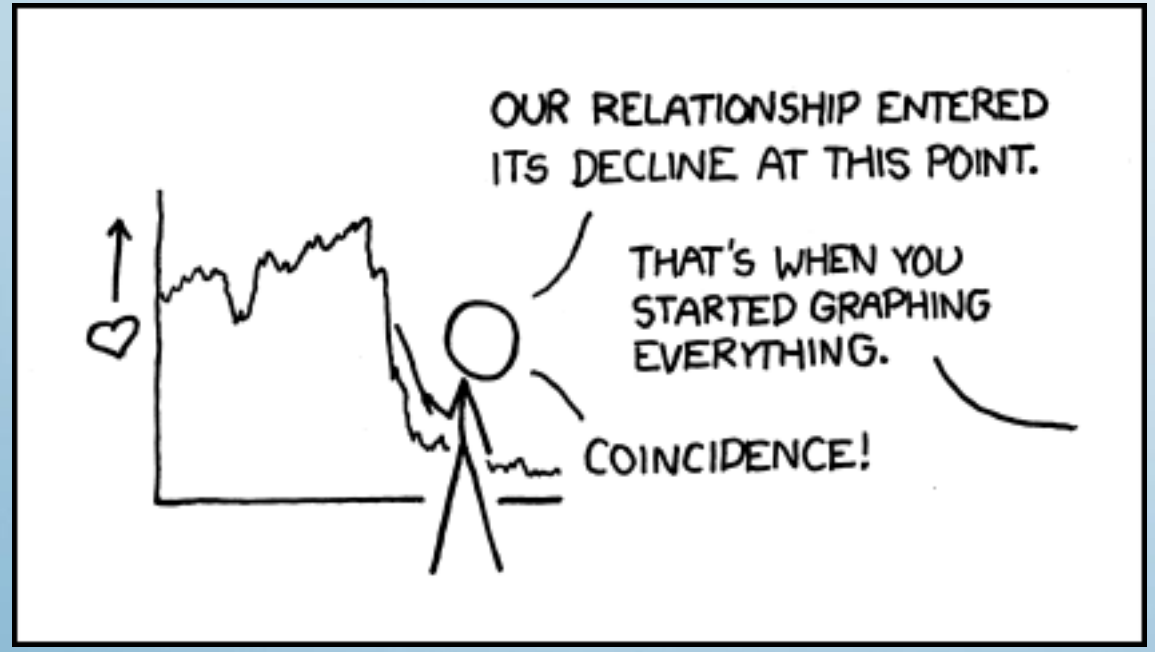
How to OUTSMART The ACT & The SAT

MATH SECTION



SAT MATH - STRUCTURE

- **Two Sections – Total of 58 questions in 80 minutes**
  - **Section 3 – No Calculator**
    - **20 questions – 25 minutes**
    - **15 multiply choice**
    - **5 grid-in**

1.25 min per question

  - **Section 4 – Calculator allowed (but not always needed!)**
    - **38 questions – 55 minutes**
    - **30 multiple choice**
    - **8 grid-in**

1.45 min per question

WHAT'S A GOOD SAT MATH SCORE?

	Score	Equivalent Score	Raw Score (# Right)	# Wrong
Outstanding	37+	750	54	4
Excellent	35	700	50	8
Very Good	32	650	44	14
Good	30	600	38	20
Average	27	540	32	26

ACT MATH - STRUCTURE

- One Section – Total of 60 questions in 60 minutes
  - Calculator is allowed for all questions (but not always needed)
  - All multiple choice – no grid-ins

1 min per question

WHAT'S A GOOD ACT MATH SCORE?

	Scaled Score	Raw Score (# Right)	# Wrong
Outstanding	33+	55	5
Excellent	30	50	10
Very Good	27	43	17
Good	25	38	22
Average	22	32	28

MATH – GENERAL STRATEGIES

- SAT Only - Do grid-ins first (as many as possible)
- Identify easiest multiple choice questions to attack first (learned from practice)
- Know the reference information cold
- Review basic math concepts (see handout)
- Use a calculator you are comfortable with
- Some questions can be done more quickly without a calculator – through practice identifying which ones

REMEMBER!

Underline what you are solving for

&

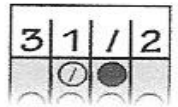
check your answer against the question!

MATH – GENERAL STRATEGIES

- Read each question carefully -- beware of multi-step questions
- Use the test booklet as scratch paper – record your work, draw diagrams!
- Eliminate any clearly wrong answers when you are trying to guess (POE)
- All questions have equal value, but not all of equal difficulty
- Always be aware of your Score Goal and your time
- Earlier questions generally easier that last questions – also in Grid-In (SAT)

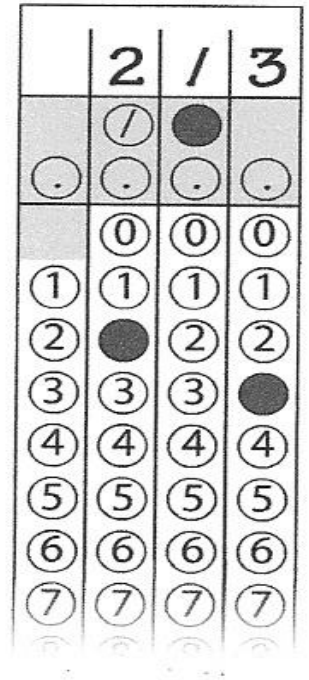
MATH STRATEGIES – GRID-IN (SAT)

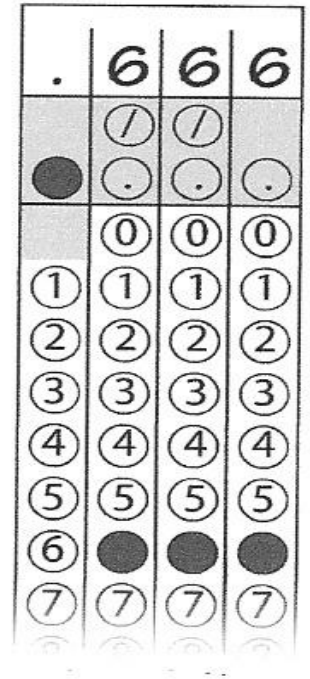
- Be completely familiar with the grid-in directions
- Do the questions you know in this section first
- Generally these questions are slightly easier because they don't give you a multiple choice
- If the answer cannot be written in the grid then it's wrong
- A fractions does not have to be reduced unless it will not fit into the answer grid

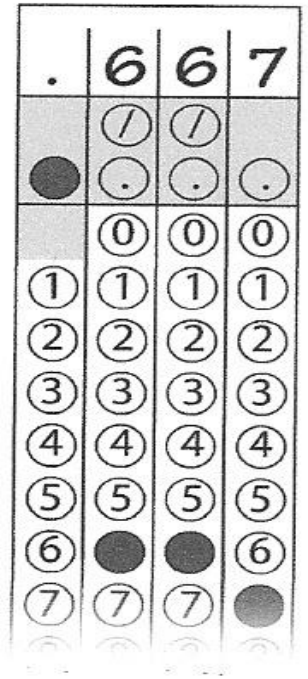
5. **Mixed numbers** such as $3\frac{1}{2}$ must be gridded as 3.5 or 7/2. (If  is entered into the grid, it will be interpreted as $\frac{31}{2}$, not $3\frac{1}{2}$.)

6. **Decimal answers:** If you obtain a decimal answer with more digits than the grid can accommodate, it may be either rounded or truncated, but it must fill the entire grid.

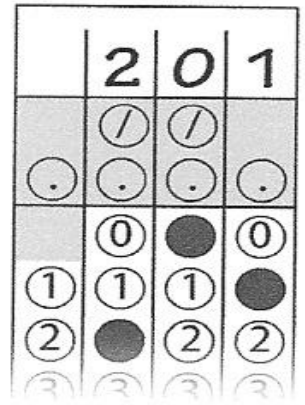
Acceptable ways to grid $\frac{2}{3}$ are:

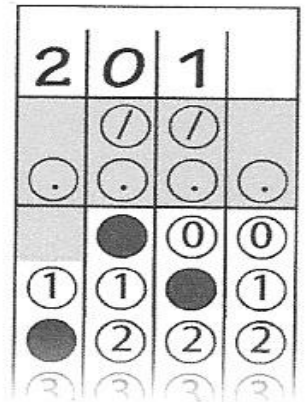






Answer: 201 – either position is correct



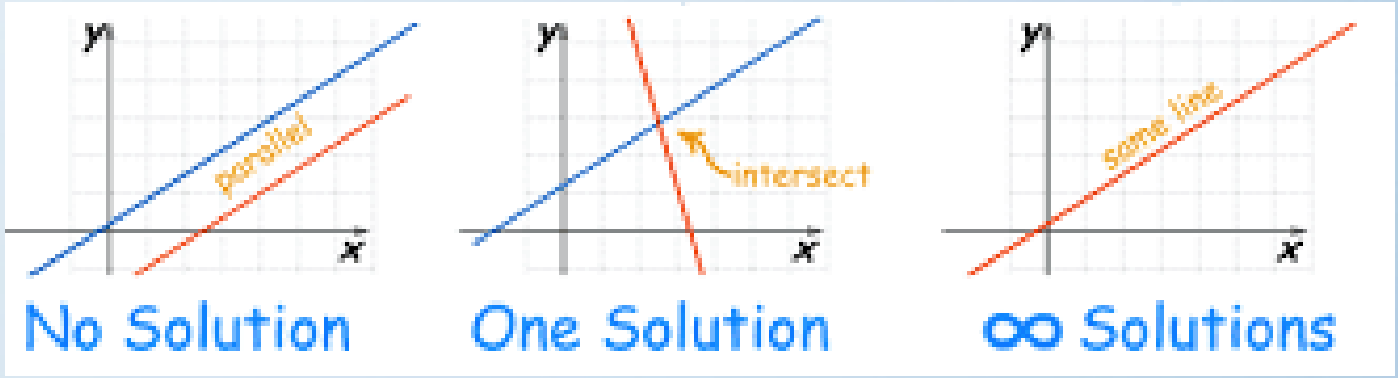


NOTE: You may start your answers in any column, space permitting. Columns you don't need to use should be left blank.

Content to Review

- Algebra, Order of operations, FOIL, Exponent rules
- Word Problems, Writing Equations
- Reading graphs/charts, Mean/Median/Mode
- Inequalities, Linear & quadratic equations
- System of equations, Exp. Growth & Decay
- Geometry & Trigonometry
  - Similar angles
  - SOHCAHTOA
  - Unit circle

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$



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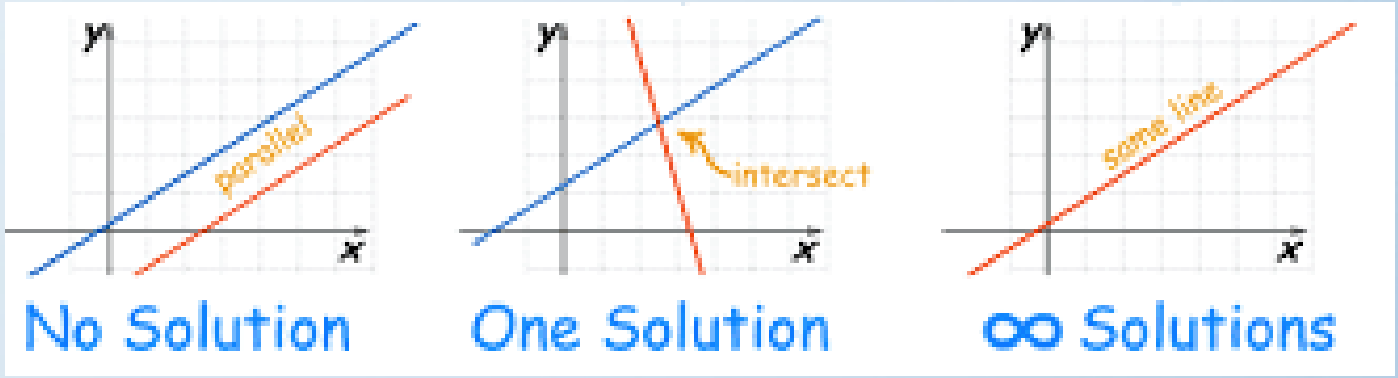


Additional Content on ACT

- Basic probability
- Adding/multiplying Matrices
- Trig Identities, Laws of Sines & Cosines
- Sine Functions (amplitude, period, etc.)
- Log Rules

$$A = \begin{bmatrix} -5 & 1 & -3 \\ 6 & 0 & 2 \\ 2 & 6 & 1 \end{bmatrix}$$

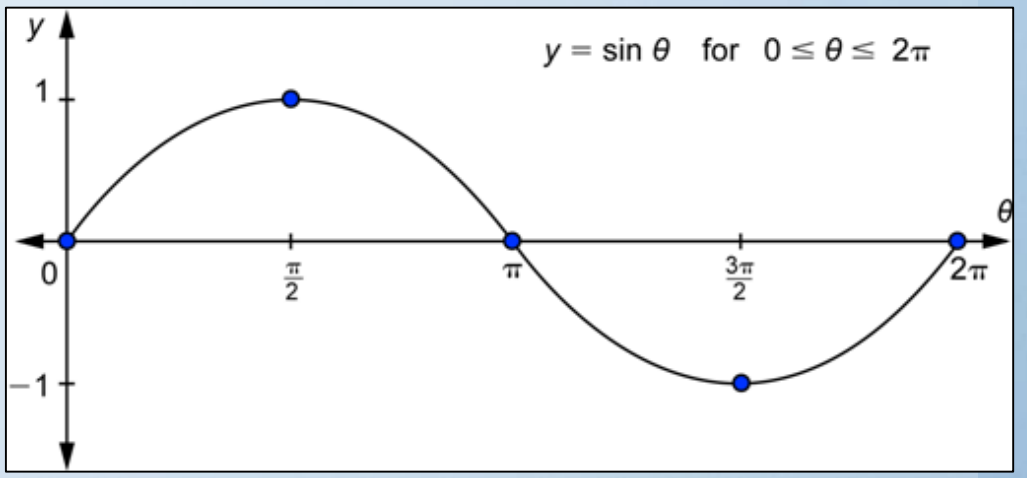
$$y = A \sin [\, k\,(\theta - b)\,] + c$$

A: Amplitude
k: Periodicity Factor (wave number)
b: Shift (left/right)
c: Shift (up/down)

Rule 1: $\log_b (M \cdot N) = \log_b M + \log_b N$

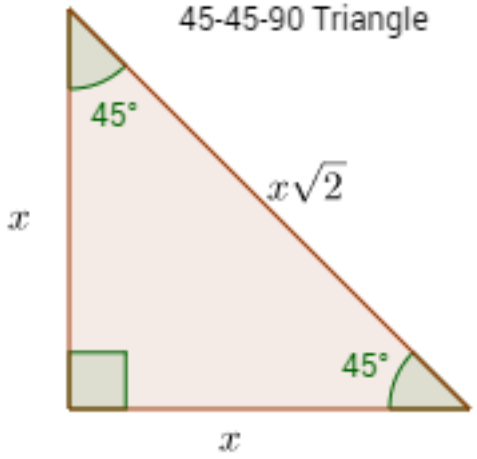
Rule 2: $\log_b \left(\frac{M}{N}\right) = \log_b M - \log_b N$

Rule 3: $\log_b \left(M^k\right) = k \cdot \log_b M$

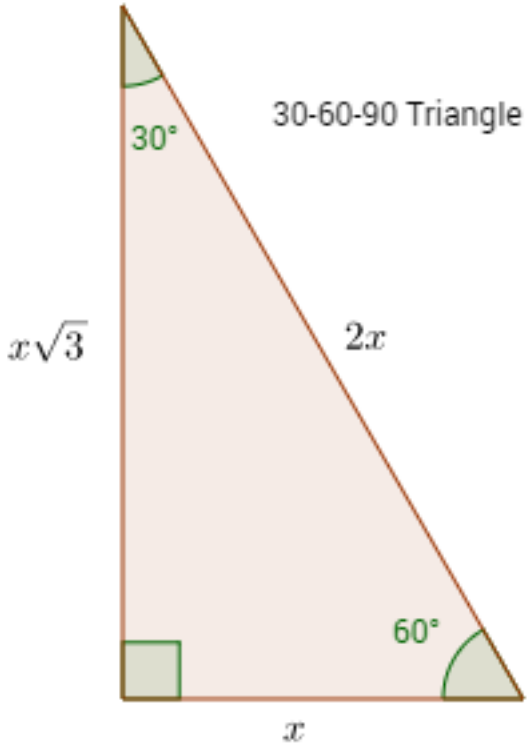


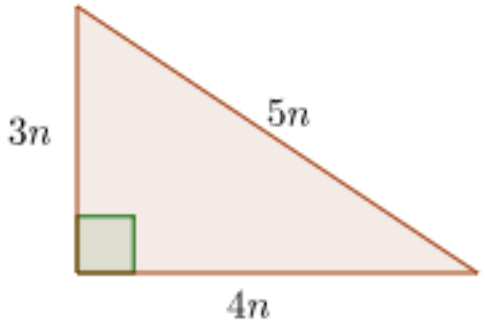
Examples of
Special Right Triangles

45-45-90 Triangle

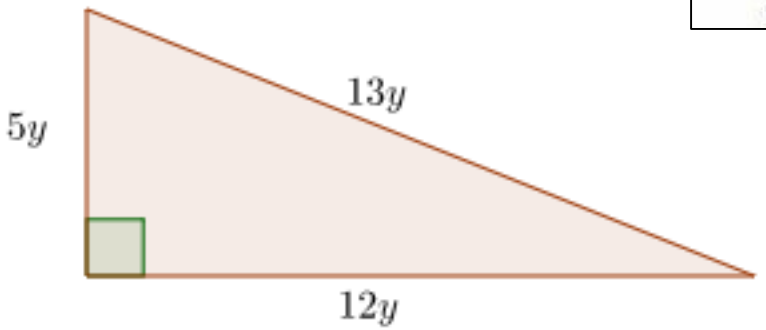


30-60-90 Triangle



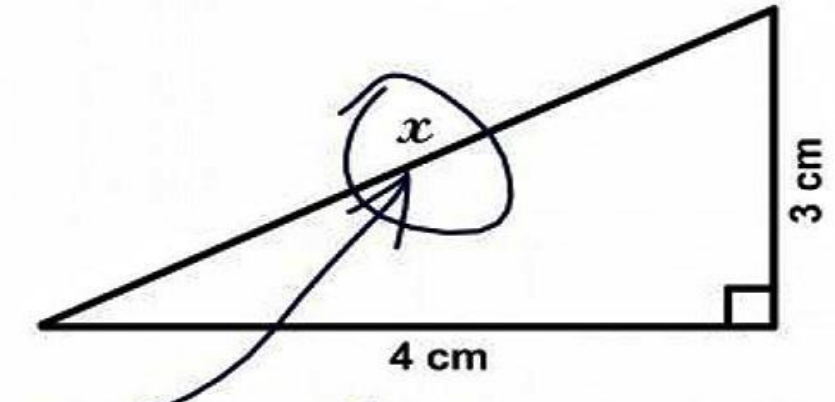


3-4-5 Triangle



5-12-13 Triangle

3. Find x.



Here it is

What if I get stuck?

- Can you simplify the expression
  - Ex: Combine like-terms, FOIL, etc.
- Can you plug in exploratory numbers
  - Ex: “How does the volume of a sphere change if the radius triples?”
- Can you directly check the multiple choice options
  - Ex: “Which set of coordinates is the solution to the system of equations?”

GUESSING STRATEGY FOR MATH

- No ***Guessing Penalty*** so all questions should be answered
- Unlike English section, it is **much more difficult** to rule out wrong answers
- Suggested strategy
  - Mark questions that you are guessing
  - Guess as you go along
  - BEFORE test pick a letter to be your guess (A, B, C or D)
  - And a backup letter (if you can eliminate that answer)
  - Stick with your guess letter (or backup). Second guessing wastes time and can make you fall victim to their carefully crafted wrong answers.

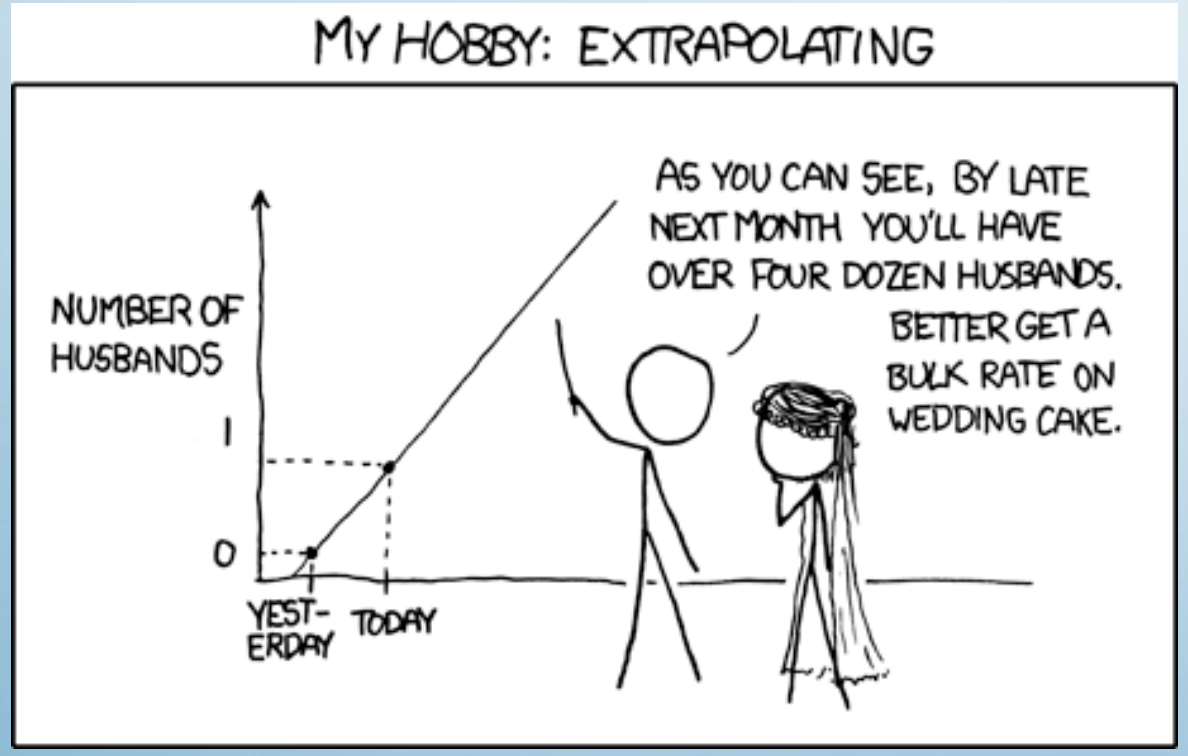
HOW TO PRACTICE FOR MATH SECTION

- Be acutely aware of your score goals – do not waste time trying to learn advanced concepts if they will only apply to one or two questions – and you don't need them to achieve the score you want
- Work hard to solidify the skills and knowledge in content areas you are already familiar with
- Know your basic math and geometry concepts cold – and know when and how to apply them
- Continued practice has a high return in the math area
- Take a few timed tests
- Use 1-2-3 method to gauge progress

FOR EACH QUESTION, ASK YOURSELF:

- What is the question asking?
- What do I know?
- Where do I find the information I need to correctly answer the question? (Reading & Science) or,
- What rules do I need to apply to arrive at the correct answer? (Writing & Language/English and Math)

ACT SCIENCE SECTION



ACT SCIENCE - STRUCTURE

- One Section – Total of 40 questions in 35 minutes
  - Usually 6 “passages” each with 6-7 questions
  - Topics:
    - Interpretation of Data
    - Scientific Investigation
    - Evaluation of Models, Inferences and Experimental Results
  - Last section on the test

WHAT'S A GOOD ACT SCIENCE SCORE?

	Scaled Score	Raw Score (# Right)	# Wrong
Outstanding	33+	37	3
Excellent	30	35	5
Very Good	27	32	8
Good	25	28	12
Average	22	22	18

ACT SCIENCE – WHAT YOU NEED TO KNOW

- Calculator is NOT permitted
- You do NOT have to bring in any outside science knowledge or facts (except a couple of questions – usually basic)
-  You DO have to be familiar with general scientific methods and terminology
- Don't be intimidated by scientific terminology
- Questions tend to get harder as you progress through a section

FOR EACH QUESTION ASK YOURSELF:

- What is the question asking?
- What do I know?
- Where do I find the information I need to correctly answer the question? (Reading & Science) or,
- What rules do I need to apply to arrive at the correct answer? (Writing & Language/English and Math)

SCIENCE – TYPES OF QUESTIONS

- Identifying trends in tables and figures
- Applied Math – because no calculator numbers in answers are often rounded
- Estimating and extrapolating – extend the line with your pencil
- Data bridge – linking multiple tables or figures to arrive at the answer
- Yes, Yes, No, No – answer choices to data/results
- Cannot be determined – choose if you cannot locate the answer
- Equations as answer choices – plug in values from table/figure to solve
- Mixing – answer is somewhere in middle of original two values
- Scatter plots – understand how points create “best fit” line

Many questions can be answered without referring to the passage description – using just the information in the chart, graph or table

SCIENCE – GENERAL STRATEGIES

- Know where to look to find the answer
  - Figure 1, Table 2 – look there
  - Based on the study – look in the text
  - Based on the results of the study – look in the data
  - According to the information – look in the text
- Know what to look for in the question or passage

When answering questions SOLELY based on a graph, chart or table, the answer must be contained IN the figure

HOW TO PRACTICE FOR THE SCIENCE SECTION

- Increase your familiarity with scientific terms and concepts
- Refresh your understanding of scientific method
- Practice reading charts, graphs, tables wherever you find them
- Take a few timed tests
- Use 1-2-3 method to gauge progress