



Today's Agenda: Math: 12:00 to 1:20 Break: 1:20-1:30 Science: 1:30-2:30

General Information before we Begin:

My name is Ms. Young- I have taught ACT prep for 8 years
I LOVE teaching & I LOVE engagement. Please participate!
It's ok if you make mistakes & get things incorrect! That's how you learn what you don't know & improve.
It is a good idea to have some paper/pens for notes AND a calculator for the math practice!

The test includes:

- Arithmetic & MIDDLE SCHOOL MATH
- Algebra
- Geometry
- Advanced Algebra
- Trigonometry
 Test of math skill – what you know



The test includes:

- Trigonometry: everyone's greatest fear... but it is only 4 questions!
 - What are some ACT Math topics you know you need to improve on? (Select as many as needed)

More Details













60 problems in 60 minutes





Timing Tips:

Start in the Middle:

The answers on the ACT are always ordered from LEAST TO GREATEST

When substituting, start in the middle with C!

The 6 consecutive integers below add up to 447.

 $\begin{array}{r}
x-2\\
x-1\\
x\\
x+1\\
x+2\\
x+3
\end{array}$

What is the value of x?

F. 72
G. 73
H. 74
J. 75
K. 76



Timing Tips:

The Last 15:

Students generally find the last problems to be the toughest.

Some pick 1 letter & guess on the last 15 questions.

Helps with time management, BUT if you see a question you know how to answer, SOLVE IT!

	Raw Scores				
Scale Score	Test 1 English	Test 2 Mathematics	Test 3 Reading	Test 4 Science	Scale Score
36	75	60	40	40	36
35	72-74	58-59	39	39	35
34	71	57	38	38	34
33	70	55-56	37	37	33
32	68-69	54	35-36	— —	32
31	67	52-53	34	36	31
30	66	50-51	33	35	30
29	65	48-49	32	34	29
28	63-64	45-47	31	33	28
27	62	43-44	30	32	27
26	60-61	40-42	29	30-31	26
25	58-59	38-39	28	28-29	25
24	56-57	36-37	27	26-27	24
23	53-55	34-35	25-26	24-25	23
22	51-52	32-33	24	22-23	22
21	48-50	30-31	22-23	21	21
20	45-47	29	21	19-20	20
19	43-44	27-28	19-20	17-18	19
18	41-42	24-26	18	16	18
17	39-40	21-23	17	14-15	17
16	36-38	17-20	15-16	13	16
15	32-35	13-16	14	12	15
14	29-31	11-12	12-13	11	14
13	27-28	8-10	11	10	13
12	25-26	7	9-10	9	12
11	23-24	5-6	8	8	11
10	20-22	4	6-7	7	10



Math Strategies





In the Absence of Numbers, Make Numbers Up:

If a question gives you variables, pick numbers that fit the parameters of the question to solve. **46.** If a < b, then |a - b| is equivalent to which of the following?

F.
$$a + b$$

G. $-(a + b)$
H. $\sqrt{a - b}$
J. $a - b$
K. $-(a - b)$







- Draw Diagrams OR Add Information to Diagrams If a question gives you a diagram, add information to it to help you solve.
- If there is no diagram, sketch one out to get a better visual of the problem.

9. In the standard (x,y) coordinate plane, point *M* with coordinates (5,4) is the midpoint of \overline{AB} , and *B* has coordinates (7,3). What are the coordinates of *A* ?

Α.	(17, 11)
В.	(9, 2)
C.	(6, 3.5)
D.	(3, 5)
Е.	(-3,-5)



Follow the Directions!

Sometimes, the ACT is especially generous & they give you a needed formula.

In that case, just plug the information into the formula!



Strategy #3:

41. In the figure below, a rader screen shows 2 ships. Ship A is located as a stance of 20 nautical miles and bearing 170°, and this is located at a distance of 30 nautical miles and bearing 300°. Which of the following is an expression for the straight-line distance, in nautical miles, between the 2 ships?

(Note: For $\triangle ABC$ with side of length *a* opposite $\angle A$, side of length *b* opposite $\angle B$, and side of length *c* opposite $\angle C$, the law of cosines states $c^2 = a^2 + b^2 - 2ab \cos \angle C$.)



300-170= 130



Geometry



Vertical Angles













Perpendicular Lines



 $\frac{2}{3} \pm -\frac{3}{2}$

Slopes of Perpendicular Lines

Slopes are <u>opposite reciprocals</u>.

 $-\frac{1}{5} \perp 5$



Parallel Lines







Slopes of Parallel Lines

Slopes are <u>equal</u>.







60

Isosceles Triangle

🗖 two equal sides 🟴

two equal angles





Equilateral Triangle



6



Interior Angles of a Triangle

180°

180°







- 1. For $\triangle ABC$ below, *D* and *E* are points on the sides of the triangle. If *AB* is parallel to *DE*, what is the measure of $\angle ACB$?
 - 80° Ask yourself: What can 100° you eliminate based on how the diagram LOOKS?
- C. 125°

Α.

B.

- D. 150°
- E. 155°





1. For $\triangle ABC$ below, *D* and *E* are points on the sides of the triangle. If *AB* is parallel to *DE*, what is the measure of $\angle ACB$?





Trust Your Eyes

In the standard (x, y) coordinate plane below, $\triangle POQ$ and $\triangle SRQ$ are isosceles right triangles with equal areas. Points O, P, Q, and R are located on the axes as shown. Which of the following could be the coordinates of point S?

F. (0, 14)
G. (7, 0)
H. (7, 14)
J. (14, 0)
K. (14, 7)





Right Triangle







Pythagorean Theorem



 $a^2 + b^2 = c^2$



2. How many centimeters long is the diagonal of a rectangle that is 5 centimeters wide and 8 centimeters long, as shown below?



Challenge Problem

3. The rectangular field shown below is 39 m wide and 80 m long. Frances and Bonita are at point D. Frances walks to point B by walking along the edge of the field through point C. Bonita gets to point B by walking diagonally across the field. About how many meters more does Frances walk than Bonita?





Circle Formulas

Area: $A = \pi r^2$ Circumference:

 $C = 2\pi r$









- 4. In the figure below, square *ABCD* has sides 12 centimeters long, and *E* is on side *AB*. In square centimeters, what is the area of ΔDEC ?
- A. 36
 B. 48
 C. 72
 D. 96
 E. 144





Challenge Problem

- 5. The figure below shows a parallelogram that is composed of a square and 2 right triangles. The perimeter of the square is 32 centimeters, and the lengths of the bases of the triangles are as indicated. What is the area, in square centimeters, of the parallelogram?
- **A.** 112
- **B.** 64
- **C.** 56
- **D.** 48



E. Cannot be determined from the given information



Algebra



Solving Equations

2x + 7 = 172x = 10x = 5





Distributive Property



 $-6a^2 - 15ab$





Multiplying Binomials

(2x+3)(7x-2)

 $14x^2 - 4x + 21x - 6$ $14x^2 + 17x - 6$









Graph (-3,6)

$$y = 2x - 3$$

4x + 3y + 5 = 0
solve for y



Statistics





• mean arithmetic average

• median middle number (when numbers are listed in order)

• mode number listed <u>most often</u>





The probability of an event is the ratio of how many ways an event can occur compared to all possibilities.

Think of probability like a fraction:

number of successes

number of possibilities





If a jar contains 50 red marbles, 30 blue marbles, and 20 white marbles, then the probability of drawing certain marbles would be:

	Red	Blue	White
number of successes	50	30	20
number of possibilities	100	100	100



Math Practice

Complete #15-30 on pgs. 26-27 of the PDF You will have 15 minutes



15.B **16.H 17.D** 18.F **19.d**

Math Practice 25. B **20.** F 26. G 21. B 27. E 22. H 28. H 23. A 29. C 24. H





BREAK! 1:20-1:30

We will continue with science promptly at 1:30!



Good News Not a test of science knowledge

Last section of the

Technical/boring

• Too long



40 questions35 minutes6 or 7 passages







Three types of passages

sciendes

Data Interpretation

• Tables • Graphs • Diagrams 90% of answers are in the data, the intro paragraph is often not needed!





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Science Experimental Design

"Science Fair" or "Lab" passages: • Control groups Variables What was different between the • experimental setups? 60% of the answers are in the data, 40% of answers are in the text

Science Experimental Design

Study 1

A dry 100 mL graduated cylinder was placed on an electronic balance and *tared* (the balance was reset to 0.000 g). H_2O was added to the graduated cylinder until a certain mass was obtained. Ethanol was added to the graduated cylinder until the volume of liquid was 50 0 mL

The density

The density repeated with A known mass of potassium iodide (KI) was dissolved in a known mass of H₂O. A dry 100 mL graduated cylinder was placed on the balance and tared. The solution was added to the graduated cylinder until the volume was 50.0 mL. The density of the liquid was then calculated.

O (see

Study 3 A solid plastic bead was placed at the bottom of a sample of each of Liquids 1–10 from Experiments 1 and 2. If the bead stayed at the bottom, "S" was recorded in Table 3. If the bead rose, "R" was recorded in Table 3. The procedure was repeated for various plastics.

Service Conflicting Viewpoint Scientist 2 Theory 2 Hypothesis 2

Scientist 1 Theory 1 Hypothesis 1

Science Conflicting Viewpoint



ISSUE: what is debated? POSITION: what is each argument? EVIDENCE: how do they back it up? DRAWBACK: flaws in their/other position

These passages are mostly text, sometimes with data or a diagram. There is only 1 per Science test, and you need to read to understand the viewpoints



Tips & Strategies

• Skim quickly

E

- Pace yourself WRITE IN YOUR "TIME OUT
 Eliminate wrong answers
 - Answer must match question
 - Answer must match passage
- Questions are ordered easy to hard WITHIN a passage. Don't skip passages!

Science Practice

Complete Passages I-III, #1-20 on pgs. 40-45. You have 15 minutes.







Science Practice

1. C 2. G 3. D 4. G 5. C 6. F 7. A 8. F 9. D 10.

11. C 12. F 13. B 14. F 15. C

THANK YOU!

Students,

Please complete a brief survey. You can open your smartphone's camera and point it at this QR code to access the survey:



Raffle winners will receive their gift cards on Tuesday!