

- 1) A game has 2 spinners. Spinner #1 has a probability of landing red of $\frac{2}{3}$. And, spinner #2 has a probability of landing red of $\frac{1}{5}$. What is the probability spinner #1 lands red AND spinner #2 does NOT land red?

- a) $\frac{2}{15}$
- b) $\frac{8}{15}$
- c) $\frac{13}{15}$
- d) $\frac{1}{5}$
- e) $\frac{3}{5}$

- 2) For some positive real number 'b', $b - 1$, $b + 4$, $3b + 2$. What is the

- a) 16
- b) 20
- c) 24
- d) 28
- e) 40

- 3) Which equation best models the following data in the table:

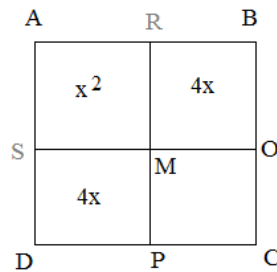
- a) $y = 1.2(4.4)^x$
- b) $y = 4.4(1.2)^x$
- c) $y = -1.2(4.4)^x$
- d) $y = -4.4(1.2)^x$
- e) $y = 1.2x^{4.4}$

x	-6.7	-1.3	3.2	8.8
y	1.30	3.47	7.89	21.89

by Lance Friedman

- 4) The figure shows a square region divided into 4 rectangle regions. If the area of ABCD is 100 what is the area of MOCP?

- a) 16
- b) 24
- c) 28
- d) 36
- e) 64



- 5) $\sin(\tan^{-1} 3) =$

- a) $\frac{1}{3}$
- b) $\frac{3\sqrt{10}}{10}$
- c) $\frac{1}{2}$
- d) $\frac{\sqrt{2}}{3}$
- e) $\frac{3}{10}$

PREVIEW/SAMPLE

150 SAT Subject Test **Math Level 2** Practice Questions (and Solutions)

Introduction

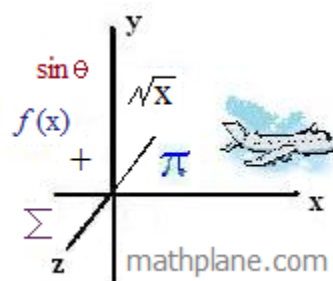
Three key aspects of a standardized test are knowledge of content, time management, and accuracy. The following practice quizzes will address all 3 aspects and likely improve your scores.

- 1) *Content* – The questions are composed from algebra II, geometry, trigonometry, and pre-calculus. You may discover specific math subjects you need to review or relearn. (**Note: Some of the questions are difficult and meant to challenge you. Don't get discouraged!). Solutions follow each test.
- 2) *Time Management* – Each section is 23-27 questions and should be completed at a rate of 1+ minute per question. (For example, if a test is 23 questions, try to complete in 25 minutes or less). Practice working with a time limit. (**Suggestion: Do the easy questions first! Skip the time-consuming, difficult problems – save them for later.)
- 3) *Accuracy* – Read the questions carefully!

Best of luck!

Lance

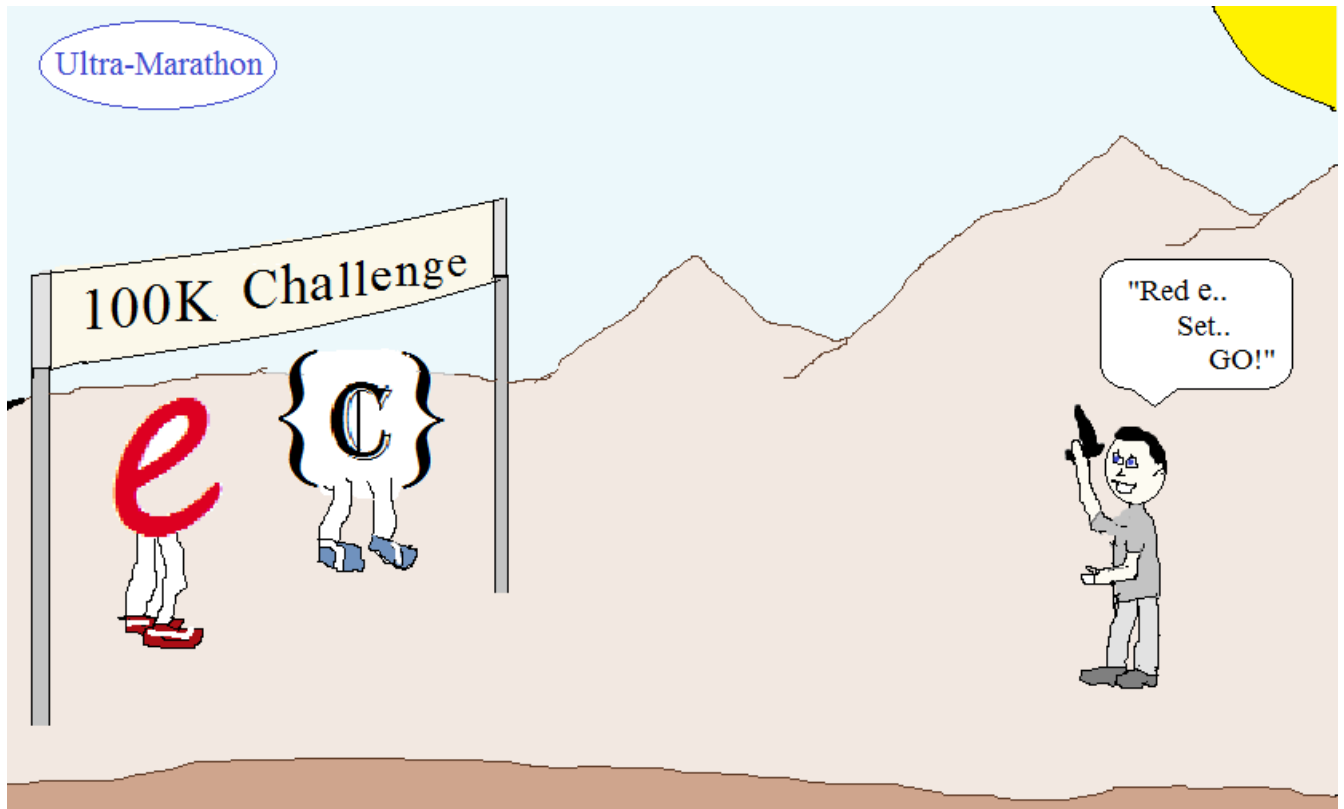
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(Plus, 4 comic questions.....)



Testing the limits of endurance,
these math figures will run on and on...

LanceAF #87 5-24-13
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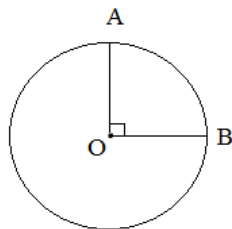
SAT Subject Test - Math Level 2 Practice

1) If $f(x) = \frac{3x + 7}{6x + 4}$ what value does $f(x)$ approach as x gets infinitely larger?

- a) 0
- b) $1/2$
- c) $3/4$
- d) $7/4$
- e) infinity

2) O is the center of the circle, and the diameter is 12. What is the arc length \widehat{AB} ?

- a) 3π
- b) 6π
- c) 9π
- d) 18π
- e) 36π



3) What is the distance in space between $(1, 0, 5)$ and $(-3, 6, 3)$?

- a) 4
- b) 6
- c) $2\sqrt{11}$
- d) $2\sqrt{14}$
- e) 12

4) $|5 - 7| - |7 - 5| =$

- a) -4
- b) 0
- c) 2
- d) 4
- e) 12

5) A line has the parametric equation $x = t + 5$ and $y = t + 10$. What is the slope of the line?

- a) 1
- b) 2
- c) 5
- d) 10
- e) 50

SAT Subject Test - Math Level 2 Practice

- 6) Two dice are tossed. What is the probability that neither die is a 4?
- a) $1/6$
 - b) $1/3$
 - c) $2/3$
 - d) $25/36$
 - e) $5/6$
- 7) $(1, 6)$, $(3, -2)$, and $(-2, K)$ are collinear points. What is K ?
- a) -6
 - b) 2
 - c) 8
 - d) 10
 - e) 18
- 8) Vectors u and v are given by $u = (3, 0)$ and $v = (1, -4)$. What is the length of vector w , given by $w = 2u - v$?
- a) $2\sqrt{10}$
 - b) $\sqrt{41}$
 - c) $6 - \sqrt{17}$
 - d) 3
 - e) $\sqrt{23}$
- 9) The domain of $g(x) = \frac{3}{\sqrt{4-x^2}}$ is:
- a) $[-2, 2]$
 - b) $(-2, 2)$
 - c) $(0, 2)$
 - d) $(-\infty, -2)$
 - e) $(-\infty, 2)$
- 10) The radius of circle $x^2 - 4x + y^2 + 6y = 3$
- a) 3
 - b) $\sqrt{3}$
 - c) 4
 - d) 8
 - e) 16

SAT Subject Test - Math Level 2 Practice

11) $f(x) = 2x + 1$ $g(x) = x^2 - 1$ $(f \circ g)(x) =$

- a) $x^2 + 2x$
- b) $2x^3 + x^2 - 2x - 1$
- c) $2x^2 - 1$
- d) $4x^2 + 4x$
- e) $2(x^2 + x + 1)$

12) The intersection of line $x + y = 2$ and circle $x^2 + y^2 = 4$ occurs when $x =$

- a) -2, 2
- b) -2, 0, 2
- c) -2, 4
- d) 0, 2
- e) 0, 4

13) Which is a zero of the function $f(x) = \sin 2(x) - 1/2$?

- a) $\frac{-\pi}{12}$
- b) $\frac{-\pi}{3}$
- c) $\frac{-\pi}{2}$
- d) 0
- e) $-\pi$

14) A circle is inscribed in a square. If the area of the square is 36 sq. units, what is the area of the circle?

- a) 6π
- b) 9π
- c) 12π
- d) 18π
- e) 36π

15) Find the sum

- a) -100
 - b) 2250
 - c) 4500
 - d) 4550
 - e) 4850
- $$\sum_{n=1}^{100} (n - 2)$$

1) If $f(x) = \frac{3x+7}{6x+4}$ what value does $f(x)$ approach as x gets infinitely larger?

- a) 0
 b) $1/2$
 c) $3/4$
 d) $7/4$
 e) infinity

Since the rational expression is neither "top heavy" nor "bottom heavy", look at the lead coefficients....

$$\frac{3}{6} = 1/2$$

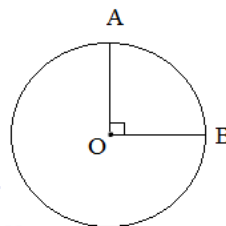
2) O is the center of the circle, and the diameter is 12. What is the arc length \widehat{AB} ?

- a) 3π
 b) 6π
 c) 9π
 d) 18π
 e) 36π

Circumference = π (diameter)
 or 2π (radius)

So, circumference of circle O is 12π

Since $\angle AOB$ is 90 degrees, the arc length of AB is $1/4$ of the circumference



$$\frac{90^\circ}{360^\circ} \cdot \pi(12) = 3\pi$$

3) What is the distance in space between $(1, 0, 5)$ and $(-3, 6, 3)$?

- a) 4
 b) 6
 c) $2\sqrt{11}$
 d) $2\sqrt{14}$
 e) 12

$$\begin{aligned} \text{distance} &= \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2 + (z_1 - z_2)^2} \\ &= \sqrt{(1 - (-3))^2 + (0 - 6)^2 + (5 - 3)^2} = \sqrt{16 + 36 + 4} = \sqrt{56} \\ &= 2\sqrt{14} \end{aligned}$$

4) $|5 - 7| - |7 - 5| =$

- a) -4
 b) 0
 c) 2
 d) 4
 e) 12

$$|-2| - |2| = 2 - 2 = 0$$

5) A line has the parametric equation $x = t + 5$ and $y = t + 10$. What is the slope of the line?

- a) 1
 b) 2
 c) 5
 d) 10
 e) 50

$$x = t + 5$$

so,

$$t = x - 5$$

then, using substitution,

$$y = (x - 5) + 10 \longrightarrow y = x + 5 \quad (\text{slope is } 1)$$

6) Two dice are tossed. What is the probability that neither die is a 4?

- a) $1/6$
 b) $1/3$
 c) $2/3$
 d) $25/36$
 e) $5/6$
- $p(\text{1st is NOT } 4) = 5/6$
 $p(\text{2nd is NOT } 4) = 5/6$
 $p(\text{neither is } 4) = (5/6)(5/6) = 25/36$
- since each die is independent,

7) $(1, 6)$, $(3, -2)$, and $(-2, K)$ are collinear points. What is K ?

- a) -6
 b) 2
 c) 8
 d) 10
 e) 18
- If 3 points are collinear, they are on the same line ---- i.e. each pair will have the same slope!
- slope of $(1, 6)$ and $(3, -2)$ is $\frac{-2 - 6}{3 - 1} = -4$
 slope of $(1, 6)$ and $(-2, K)$ must be -4 $\frac{K - 6}{-2 - 1} = -4$ $K = 18$

8) Vectors u and v are given by $u = (3, 0)$ and $v = (1, -4)$. What is the length of vector w , given by $w = 2u - v$?

- a) $2\sqrt{10}$
 b) $\sqrt{41}$
 c) $6 - \sqrt{17}$
 d) 3
 e) $\sqrt{23}$
- $w = 2(3, 0) - (1, -4)$
 $w = (5, 4)$
 $\|w\| = \sqrt{(5)^2 + (4)^2} = \sqrt{41}$

9) The domain of $g(x) = \frac{3}{\sqrt{4 - x^2}}$ is:

- a) $[-2, 2]$
 b) $(-2, 2)$
 c) $(0, 2)$
 d) $(-\infty, -2)$
 e) $(-\infty, 2)$
- cannot have negative under a radical
 and cannot have zero in the denominator...
 so, must be between -2 and 2

10) The radius of circle $x^2 - 4x + y^2 + 6y = 3$

- a) 3
 b) $\sqrt{3}$
 c) 4
 d) 8
 e) 16
- complete the square to change into standard form...
 $x^2 - 4x + 4 + y^2 + 6y + 9 = 3 + 4 + 9$
 $(x - 2)^2 + (y + 3)^2 = 16$ radius = 4
 $(x - h)^2 + (y - k)^2 = r^2$

11) $f(x) = 2x + 1$ $g(x) = x^2 - 1$

$(f \circ g)(x) =$

a) $x^2 + 2x$

b) $2x^3 + x^2 - 2x - 1$

c) $2x^2 - 1$

d) $4x^2 + 4x$

e) $2(x^2 + x + 1)$

$f(g(x)) = 2(x^2 - 1) + 1$

$2x^2 - 2 + 1$

$2x^2 - 1$

12) The intersection of line $x + y = 2$ and circle $x^2 + y^2 = 4$ occurs when $x =$

a) $-2, 2$

b) $-2, 0, 2$

c) $-2, 4$

d) $0, 2$

e) $0, 4$

solve algebraically:

$y = -x + 2$

$x^2 + y^2 = 4$

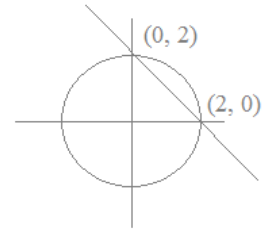
(substitution)

$x^2 + (-x + 2)^2 = 4$

$x^2 + x^2 - 4x + 4 = 4$

$2x^2 - 4x = 0$

$2x(x - 2) = 0$ $x = 0, 2$



13) Which is a zero of the function $f(x) = \sin 2x - 1/2$?

a) $-\frac{\pi}{12}$

b) $-\frac{\pi}{3}$

c) $-\frac{\pi}{2}$

d) 0

e) $-\pi$

$\sin 2x - 1/2 = 0$

$\sin 2x = 1/2$

$2x = \frac{\pi}{6}$

$x = \frac{\pi}{12}$

14) A circle is inscribed in a square. If the area of the square is 36 sq. units, what is the area of the circle?

a) 6π

b) 9π

c) 12π

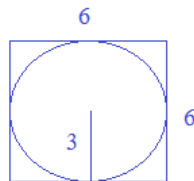
d) 18π

e) 36π

Area of circle = πr^2

area = $\pi 3^2$

= 9π



since area of square is 36, each side is 6...

If a side is 6, then the radius must be 3...

15) Find the sum

a) -100

b) 2250

c) 4500

d) 4550

e) 4850

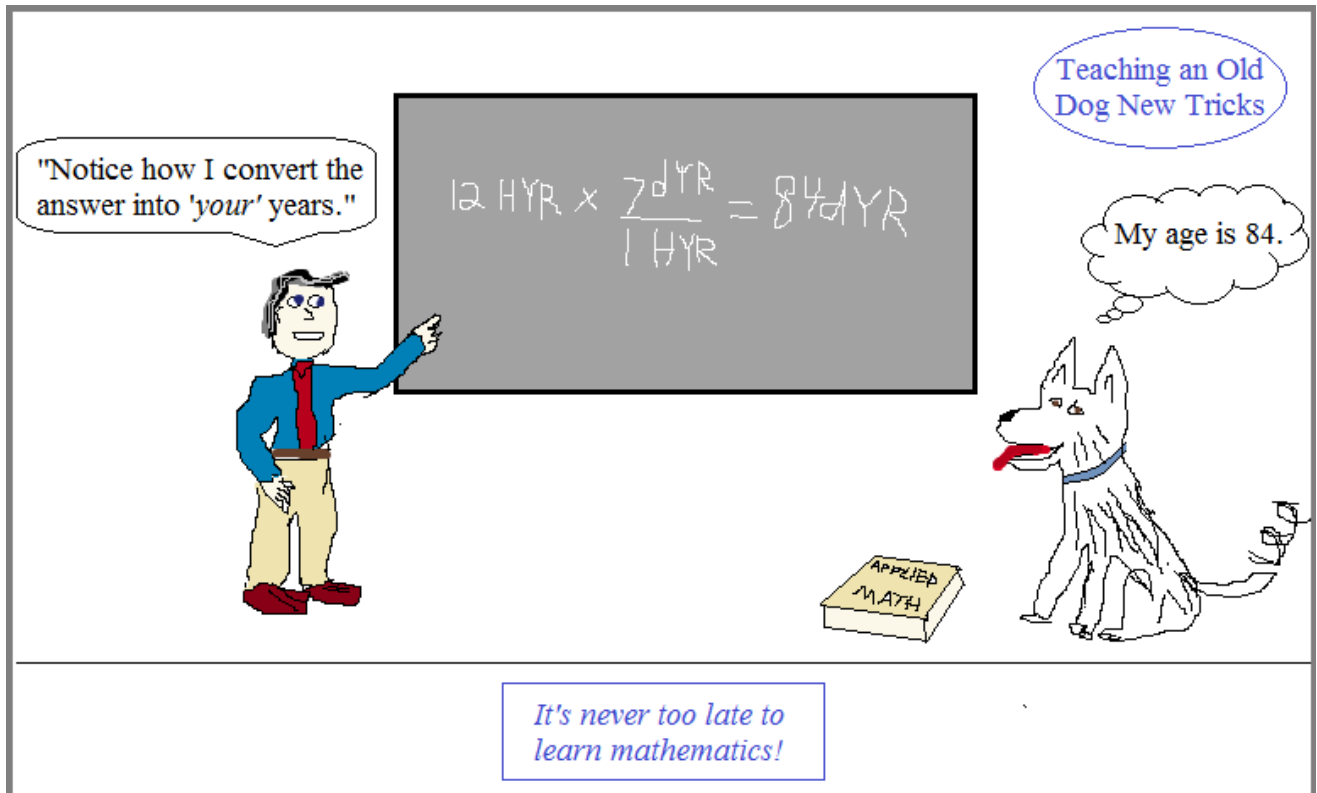
$\sum_{n=1}^{100} (n - 2)$

$\sum_{n=1}^{100} n - \sum_{n=1}^{100} 2$

$(100 + 1)(50) - 2(100)$
= 4850

sum formula: $\frac{n(a_1 + a_n)}{2}$
number of terms first term last term

If you found this (SAT Subject Test Practice – **Math LEVEL 2**) preview useful, consider ordering the full packet or visit mathplane.com



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