

SAT/ACT: Practice Test

Section I Multiple Choice

In the following problems you have five choices for an answer. Only one choice is correct. On the SAT or ACT, you will mark your choice on the special answer sheet. Your teacher will provide you with a sample answer sheet.

1 If $x - 4 = x^2 - 6$, then $x =$

- (A) 1 or 2
- (B) -1 or 2
- (C) 0 or 2
- (D) -1 or -2
- (E) -1 or 4

3 Mark bought 14 tapes, some priced at \$6 each and the rest priced at \$8 each. If he spent \$94 altogether, how many tapes did he buy at each price?

- (A) 6 at \$6 and 8 at \$8
- (B) 7 at \$6 and 7 at \$8
- (C) 8 at \$6 and 6 at \$8
- (D) 9 at \$6 and 5 at \$8
- (E) 10 at \$6 and 4 at \$8

2 If a square is copied beside itself to produce a rectangle, $\frac{\text{perimeter of rectangle}}{\text{perimeter of square}} =$

- (A) 4
- (B) 3
- (C) 2
- (D) 1.5
- (E) 1

4 If $\frac{x - 2}{x + 2} = \frac{1}{2}$, then $x =$

- (A) 2
- (B) 3
- (C) 4
- (D) 5
- (E) 6

SAT/ACT: Practice Test

Section I Multiple Choice (Continued)

5 Jorge bought 16 CDs at a cost of \$9 each. How many \$12 CDs could he have bought for the amount he paid?

- (A) 8
- (B) 9
- (C) 10
- (D) 12
- (E) 21

7 Jason worked 20 hours at \$5 per hour and 30 hours at \$6 per hour. What was his average hourly wage?

- (A) \$5.20
- (B) \$5.40
- (C) \$5.50
- (D) \$5.60
- (E) \$5.65

6 Five people split the following costs equally among themselves:

\$12.40, \$10.95, \$16.75, \$6.10.

How much did each person pay?

- (A) \$9.24
- (B) \$11.55
- (C) \$20.22
- (D) \$33.21
- (E) \$66.42

8 $2^2 + (2^3)^2 = ?$

- (A) $(2^2)17$
- (B) 2^7
- (C) 2^8
- (D) 10^2
- (E) $2^2(5)$

All rights reserved.

© Pearson Education, Inc., publishing as Pearson Prentice Hall.



SAT/ACT: Practice Test

Section I Multiple Choice (Continued)

9 $x^2 - 4 = 3x$. Then $x =$?

- (A) 2 or -2
- (B) 0
- (C) 4 or -1
- (D) 3 or 0
- (E) 2, -2 , or 0

11 Ted bought 3 books at m dollars each. The sales tax on his purchase was 5% of the cost of the books. Which of the following expresses the total cost of his purchase?

- (A) $15m$
- (B) $0.15m$
- (C) $18m$
- (D) $3.15m$
- (E) $3m + 0.05$

10 In simplified form, $\frac{x^6 + x^4}{x^2}$ equals

- (A) $x^3 + x^2$
- (B) $x^4 + x^2$
- (C) x^5
- (D) x^8
- (E) x^{12}

12 If $-5x \geq 20$, which of the following is true?

- (A) $x \leq 15$
- (B) $x \leq 4$
- (C) $x \leq -4$
- (D) $x \geq 15$
- (E) $x \geq -4$

SAT/ACT: Practice Test

Section I Multiple Choice (Continued)

- 13** Which of the following pairs (x, y) is a solution of the system?

$$\begin{aligned}x + y &= 4 \\ -x + 2y &= -1\end{aligned}$$

- (A) (1, 3)
- (B) (3, 1)
- (C) (2, 2)
- (D) (5, -1)
- (E) (-2, 6)

- 15** A line segment is drawn from $A(14, 10)$ to $B(6, 4)$. Find the distance from A to the midpoint of the segment.

- (A) 3
- (B) 4
- (C) 5
- (D) 6
- (E) 8

- 14** If $\frac{1}{a+b} = 5$, then $b =$?

- (A) $\frac{1}{5} - a$
- (B) $-5a$
- (C) $1 - a$
- (D) $\frac{1+5a}{5}$
- (E) $\frac{1-a}{5}$

- 16** Where does the line $6x - 2y = -10$ cross the y -axis?

- (A) -10
- (B) $-\frac{5}{3}$
- (C) 3
- (D) 5
- (E) 10



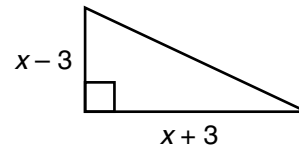
SAT/ACT: Practice Test

Section I Multiple Choice (Continued)

17 Which of the following points are on the line $y = 3x - 5$?

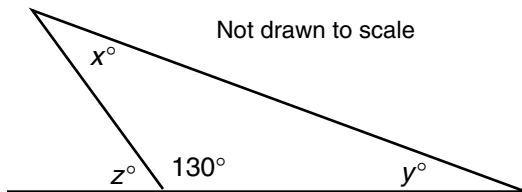
- I. (2, -1)
- II. (4, 3)
- III. (0, -5)

- (A) I only
- (B) II only
- (C) III only
- (D) I and III only
- (E) II and III only



19 For what value of x is the area of the above triangle equal to 36?

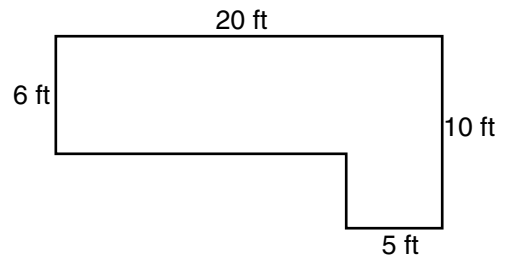
- (A) $3\sqrt{2}$
- (B) 3
- (C) $3\sqrt{5}$
- (D) 9
- (E) 12



18 Which statements could be true for this figure?

- I. $z = x + y$
- II. $z > y$
- III. $z = x$

- (A) I only
- (B) II only
- (C) I and II only
- (D) II and III only
- (E) I, II, and III



20 The perimeter of the above figure, in feet, is

- (A) 200
- (B) 140
- (C) 60
- (D) 52
- (E) 41

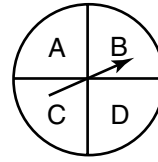
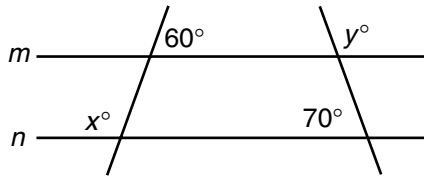
All rights reserved.

© Pearson Education, Inc., publishing as Pearson Prentice Hall.



SAT/ACT: Practice Test

Section I Multiple Choice (Continued)



21 In the figure above, $m \parallel n$. What is the sum $x + y$?

- (A) 130
- (B) 180
- (C) 200
- (D) 230
- (E) 270

23 The areas of the four sectors of the spinner are equal. The probability of spinning C and tossing a head with a penny is

- (A) 8
- (B) 1
- (C) $\frac{3}{4}$
- (D) $\frac{1}{2}$
- (E) $\frac{1}{8}$

22 The expression $\frac{\sin^2 x + \cos^2 x}{\sec x}$ simplifies to

- (A) $\sin x$
- (B) $\cos x$
- (C) $\tan x$
- (D) $\sec x$
- (E) $\csc x$

24 A spinner has 12 sections of equal area. The probability of spinning red is $\frac{1}{3}$ and the probability of spinning red or yellow is $\frac{3}{4}$. The number of yellow sections is

- (A) 2
- (B) 4
- (C) 5
- (D) 6
- (E) 9



SAT/ACT: Practice Test

Section I Multiple Choice (Continued)

25 Which of the following is next in the sequence?

1, 5, 9, 13, 17, ?

- (A) 20
- (B) 21
- (C) 22
- (D) 23
- (E) 24

27 Which of these lines is perpendicular to the line $y = 2x + 6$?

- (A) $2y = -4x + 3$
- (B) $2y = 4x + 3$
- (C) $2y = x + 3$
- (D) $-2y = x + 3$
- (E) $x + y = 6$

26 The coordinates of the midpoint of \overline{LN} with endpoints $L(-1, -3)$ and $N(3, -5)$ are

- (A) (1, -4)
- (B) (-2, 1)
- (C) (-1, -4)
- (D) (1, 4)
- (E) (0, -4)

28 Which of the following statements is *not* true for the equation $4x + 3y = 15$?

- (A) The y -intercept is 5.
- (B) The line has a positive slope.
- (C) The x -intercept is 3.75.
- (D) The line contains the point (3, 1).
- (E) none of the above



SAT/ACT: Practice Test

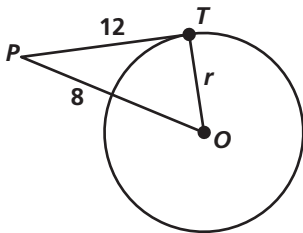
Section I Multiple Choice (Continued)

29 Which of the following is true?

- (A) $5^0 = 0$
- (B) $\frac{1}{5^0} = \frac{1}{5}$
- (C) $\frac{x^6}{x^2} = x^3$
- (D) $(2x)^4 = 8x^4$
- (E) none of the above

31 Which of the following is an irrational number?

- (A) $\sqrt{2}$
- (B) 0.125
- (C) $\frac{1}{3}$
- (D) 101
- (E) $\sqrt{81}$



30 \overline{PT} is tangent to $\odot O$ at T . Find the value of r .

- (A) 4
- (B) 5
- (C) 6
- (D) 8
- (E) 10

32 For art class, you have constructed a model of your family's car. If your model is 4 inches high and your car is 5 feet high, what scale factor did you use?

- (A) $\frac{4}{5}$
- (B) $\frac{5}{4}$
- (C) $\frac{1}{20}$
- (D) $\frac{1}{15}$
- (E) none of the above

All rights reserved.

© Pearson Education, Inc., publishing as Pearson Prentice Hall.

STOP

SAT/ACT: Practice Test

Section II Student-Produced Responses

After you solve each problem on this section, enter your answer on the special grid of your sample answer sheet.

1 What is the greatest value out of $\frac{3}{10}$, 0.03, and $\frac{2}{5}$?

3 The product of $(5 - 1)$, $(5 - 2)$, and $(5 - 3)$ equals twice the sum of x and 5. Then $x = \underline{\quad}$?

2 If $\frac{1}{x} = \sqrt{0.04}$, then x equals $\underline{\quad}$?

4 Find the value of $n^4 - n^3$ when $n = -3$.

All rights reserved.

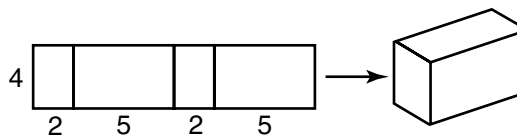
© Pearson Education, Inc., publishing as Pearson Prentice Hall.



SAT/ACT: Practice Test

Section II Student-Produced Responses (Continued)

- 5 What is the positive solution to $2x^2 - 5x - 3 = 0$?



- 7 The figure on the left is folded to form a bottomless, topless box. If a top and bottom are put on the box, what is their combined area?

- 6 What is the sum of the measures of the interior angles of a 6-sided polygon?

- 8 The areas of two similar triangles are 98 in.^2 and 162 in.^2 . What is the ratio of their perimeters when comparing smaller to larger?



SAT/ACT: Practice Test

Section II Student-Produced Responses (Continued)

9 Two-thirds of 24 is equal to 25 percent of what number?

10 What is the constant term of $\frac{3x^4 + 9x^3 - 2x^2 + 18}{x + 3}$?

All rights reserved.

© Pearson Education, Inc., publishing as Pearson Prentice Hall.

STOP

Answers: SAT/ACT Practice Test

Multiple Choice

1. (A) **(B)** (C) (D) (E)
 2. (A) (B) (C) **(D)** (E)
 3. (A) (B) (C) **(D)** (E)
 4. (A) (B) (C) (D) **(E)**
 5. (A) (B) (C) **(D)** (E)
 6. **(A)** (B) (C) (D) (E)
 7. (A) (B) (C) **(D)** (E)
 8. **(A)** (B) (C) (D) (E)
 9. (A) (B) **(C)** (D) (E)
 10. (A) **(B)** (C) (D) (E)
 11. (A) (B) (C) **(D)** (E)
 12. (A) (B) **(C)** (D) (E)
 13. (A) **(B)** (C) (D) (E)
 14. **(A)** (B) (C) (D) (E)
 15. (A) (B) **(C)** (D) (E)
 16. (A) (B) (C) **(D)** (E)
 17. (A) (B) **(C)** (D) (E)
 18. (A) (B) **(C)** (D) (E)
 19. (A) (B) (C) **(D)** (E)
 20. (A) (B) **(C)** (D) (E)
 21. (A) (B) (C) **(D)** (E)
 22. (A) **(B)** (C) (D) (E)
 23. (A) (B) (C) (D) **(E)**
 24. (A) (B) **(C)** (D) (E)
 25. (A) **(B)** (C) (D) (E)
 26. **(A)** (B) (C) (D) (E)
 27. (A) (B) (C) **(D)** (E)
 28. (A) **(B)** (C) (D) (E)
 29. (A) (B) (C) (D) **(E)**
 30. (A) **(B)** (C) (D) (E)
 31. **(A)** (B) (C) (D) (E)
 32. (A) (B) (C) **(D)** (E)

Student-Produced Responses

1.

2		/	5
.	.	.	.
0	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9
2.

5			
.	.	.	.
0	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9
3.

7			
.	.	.	.
0	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9
4.

1		0	8
.	.	.	.
0	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9
5.

3			
.	.	.	.
0	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9
6.

7		2	0
.	.	.	.
0	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9
7.

20			
.	.	.	.
0	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9
8.

.	7		8
.	.	.	.
0	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9
9.

6		4	
.	.	.	.
0	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9
10.

6			
.	.	.	.
0	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9

All rights reserved.

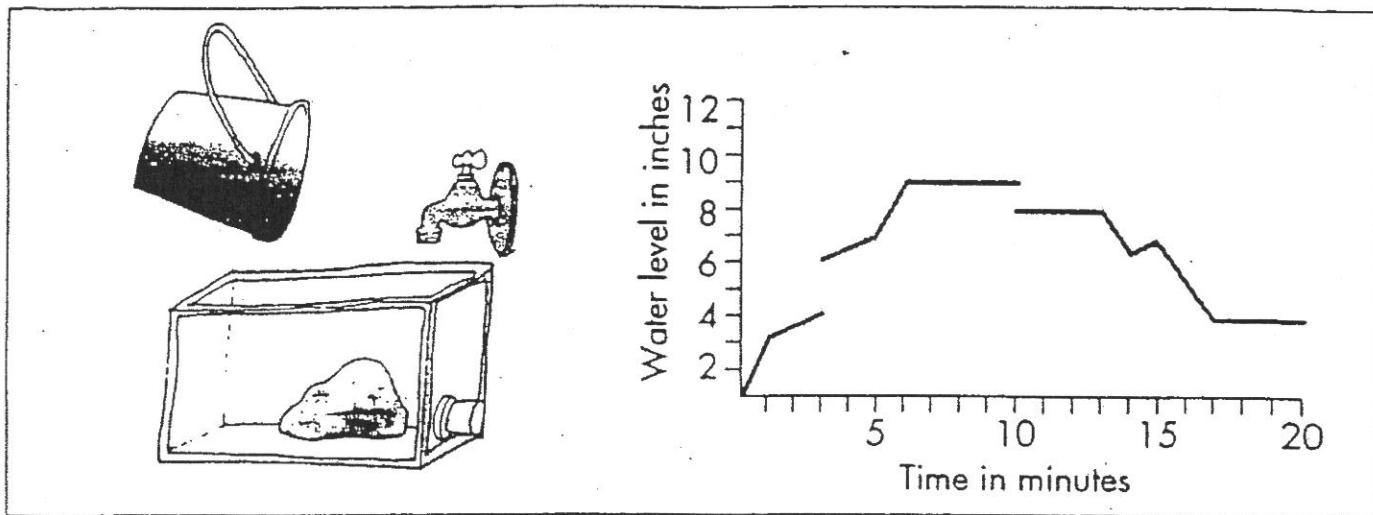
© Pearson Education, Inc., publishing as Pearson Prentice Hall.

AQUARIUM ACTIVITY

by Tom Dick, Oregon State University, Corvallis, Oregon



BELOW IS AN illustration of an aquarium along with a graph of its water level as a function of time. When the faucet is on, the water level rises at a steady rate. Similarly, when the plug is pulled out, the water level falls at a steady rate (but slower than the faucet's rate). At various times some events happen that affect the water level and/or the rate at which the water level changes. Identify at exactly what time the given event occurred.



1. The plug is pulled out with the faucet turned off.
2. A large rock is pulled out of the aquarium.
3. The plug is pulled out with the faucet turned on.
4. The plug is put in with the faucet turned off.
5. The plug is put in with the faucet turned on.
6. The faucet is turned on with the plug in.
7. The faucet is turned on with the plug out.
8. A bucket of water is dumped into the aquarium all at once.
9. The faucet is turned off with the plug in.
10. The faucet is turned off with the plug out.

Note: This is an excellent activity for small cooperative groups. Students with weaker algebraic skills are at no disadvantage and often come up with key insights that students with stronger algebraic skills do not.

Activity from Dick and Patton, *Calculus*, International Thompson Publishing

Slopes of a Curve

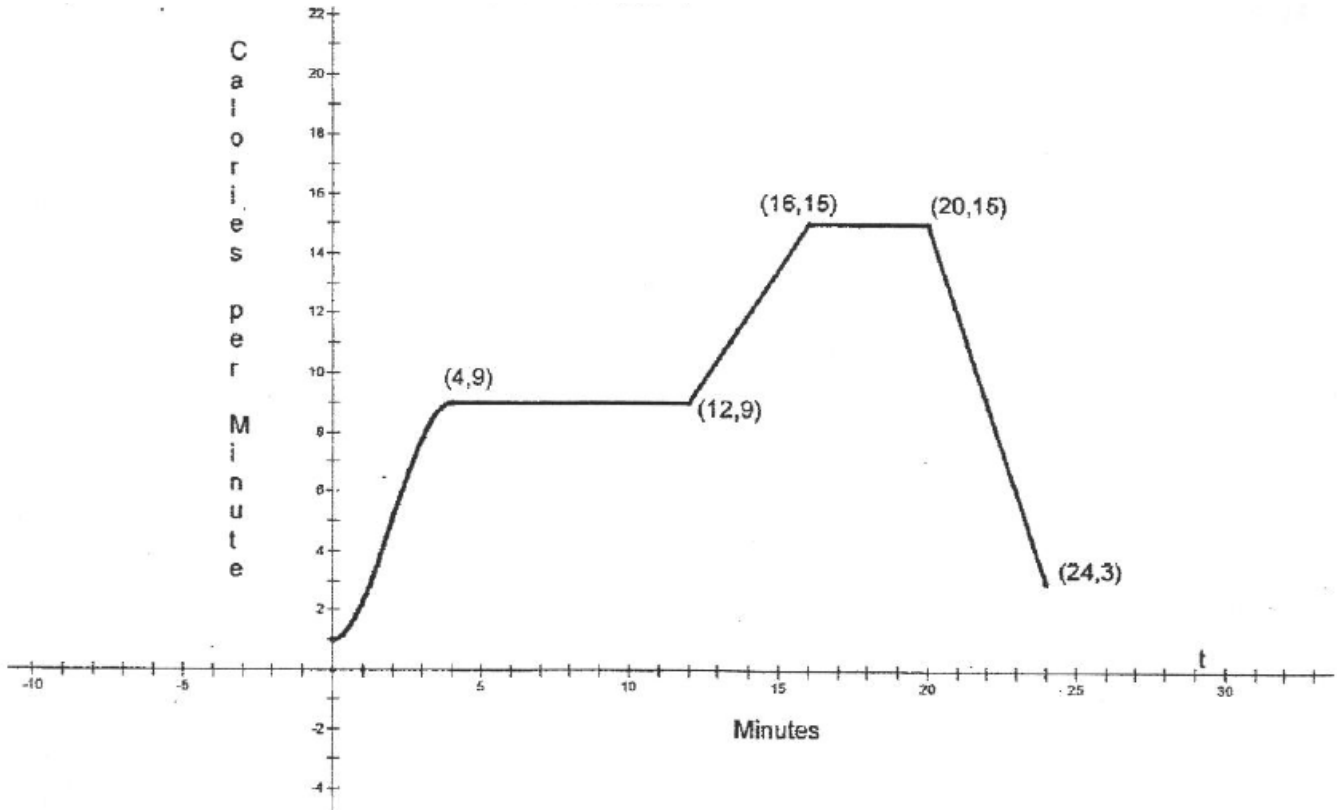
Pre-AP topic

Name: _____

Date: _____ Period: _____

The rate, in calories per minute, at which a person using an exercise machine burns calories, is modeled by the function f . In the figure below, $f(t) = -\frac{1}{4}t^3 + \frac{3}{2}t^2 + 1$ for $0 \leq t \leq 4$ and f is piecewise linear for $4 \leq t \leq 24$.

Note: $1 \leq t \leq 4$ means that t is between 1 and 4, including 1 and 4 since it is a closed interval.



Write f as a piecewise linear function for $0 \leq t \leq 24$.

Time interval	$0 \leq t \leq 4$	$4 \leq t \leq 12$	$12 \leq t \leq 16$	$16 \leq t \leq 20$	$20 \leq t \leq 24$
Slope of $f(t)$	N/A (not a linear function)				
Equation of $f(t)$ in slope-intercept form	$y = -\frac{1}{4}x^3 + \frac{3}{2}x^2 + 1$				
Is $f(t)$ increasing, decreasing, or constant? Justify your answer.					
Is the slope of $f(t)$ increasing, decreasing, or constant? Justify.					

- (a) What is the slope of f at $t = 22$? Indicate units of measure.
- (b) For the time interval $0 \leq t \leq 24$, make a conjecture as to what time interval f is increasing at its greatest rate. Explain your reasoning.