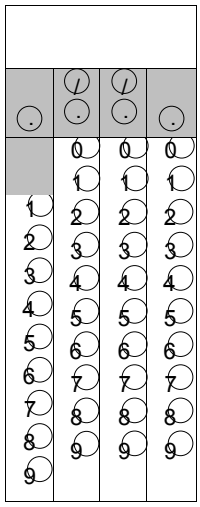
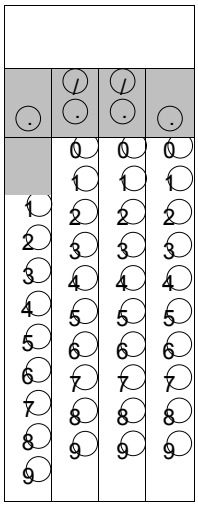
SAT Math Practice Test Two

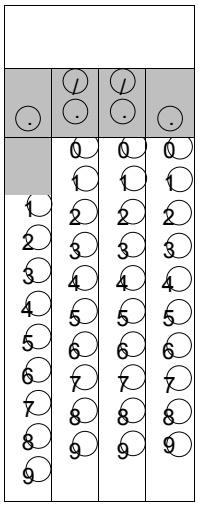
SAT 数学模拟试题二

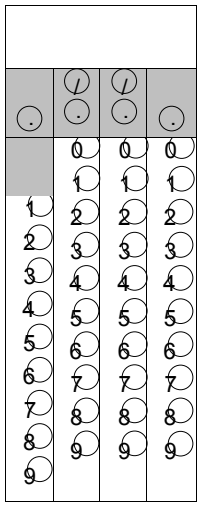


10.

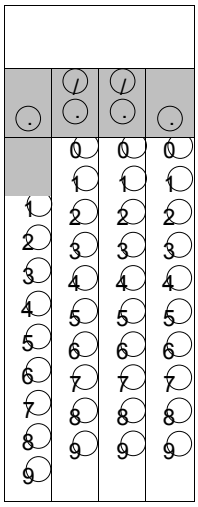


11.

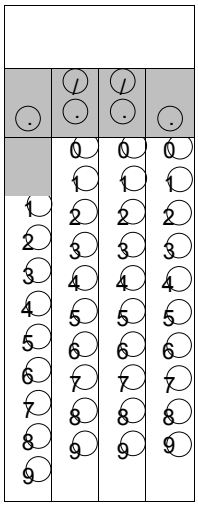


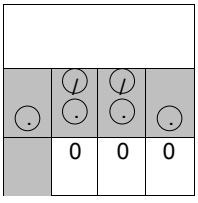


14.

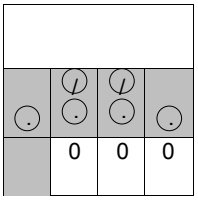


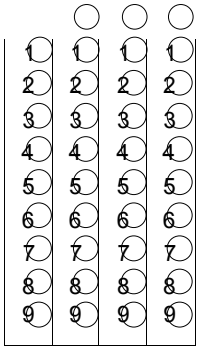
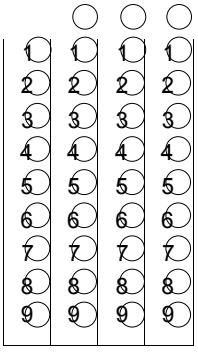
15.





18.



CUT HERE

Test IIA

1	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
2	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
3	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
4	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
5	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
6	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
7	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
8	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ

9.

10.

11.

12.

	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

13.

14.

15.

16.

	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

17.

18.

1	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
2	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
3	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
4	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
5	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
6	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
7	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
8	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
9	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
10	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
11	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
12	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
13	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
14	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
15	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
16	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
17	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
18	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
19	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
20	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ

CUT HERE

Test IIC

1	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
2	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
3	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
4	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
5	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
6	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
7	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
8	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
9	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
10	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
11	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
12	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
13	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ

Practice Test II

Practice Test IIA: 25 Minutes, 18 Questions (8 Multiple-Choice and 10 Grid-in)

Practice Test IIB: 25 Minutes, 20 Multiple-Choice Questions

Practice Test IIC: 20 Minutes, 16 Multiple-Choice Questions

Practice Test IIA

Time: 25 minutes

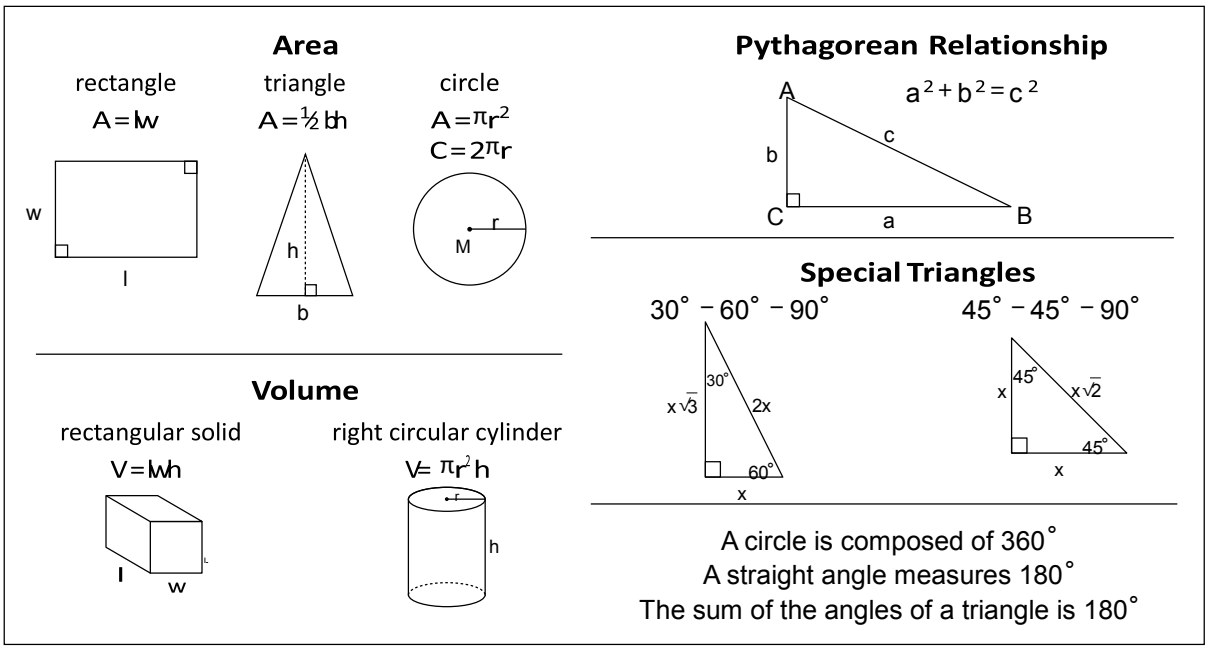
18 questions (8 multiple-choice and 10 grid-in)

Directions: This section is composed of two types of questions. Use the 25 minutes allotted to answer both question types. For Questions 1–8, select the one correct answer of the five choices given and mark the corresponding circle on your answer sheet. Your scratch work should be done on any available space in the section.

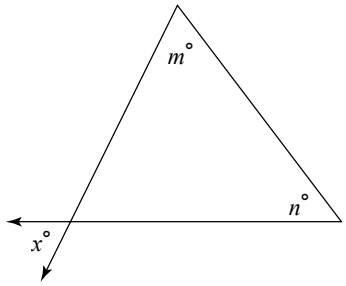
Notes

1. All numbers used are real numbers.
2. Calculators may be used.
3. Some problems may be accompanied by figures or diagrams. These figures are drawn as accurately as possible EXCEPT when it is stated in a specific problem that a figure is not drawn to scale. The figures and diagrams are meant to provide information useful in solving the problem or problems. Unless otherwise stated, all figures and diagrams lie in a plane.

Data That Can Be Used for Reference



1. If $7x - 5 = 4x - 17$, what is the value of x?



A. –6
B. –4
C. 1
D. 4
E. 5

Note: Figure not drawn to scale.

2. In the figure above, if $x = 50$, what is the value of $m + n$?

A. 50
B. 65
C. 75
D. 110
E. 130

3. In the xy-plane, the line with equation $y = 3x - 12$ crosses the x-axis at one point. What is the x-coordinate of this point?

A. –12
B. –4
C. 0
D. 3
E. 4

4. The average (arithmetic mean) of $5x$ and $3y$ is equal to 4 less than the product of x and y. Which of the following equations states the relationship given in the previous sentence?

A. $\frac{5x + 3y}{2} = -4 \quad xy$
B. $\frac{5x + 3y}{2} = \frac{xy}{4}$
C. $\frac{5x - 3y}{2} = -xy \quad 4$
D. $\frac{\sqrt{5x + 3y}}{2} = -xy \quad 4$
E. $\frac{5x - 3y}{2} = -4 \quad xy$

5. The number that results from 3^n, where n is a positive integer, CANNOT end in which of the following digits?

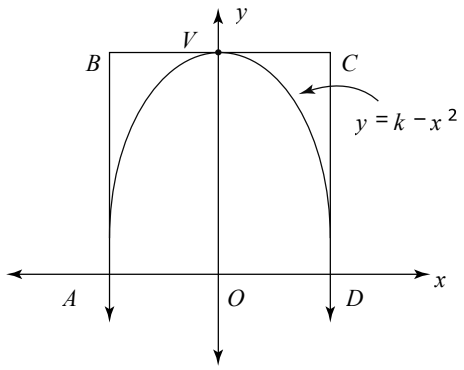
A. 1
B. 3
C. 5
D. 7
E. 9

6. A discount of 20%, followed by another discount of 25%, is equivalent to a single discount of what percent?

A. 33%
B. 40%
C. 45%
D. 55%
E. 60%

7. The equation $|2x - 3| = 7$ is true for which value(s) of x?

A. 2 only
B. 5 only
C. 2 and 5 **D.** –2 and 5
E. 2 and –5



Note: Figure not drawn to scale.

8. The figure above shows the graph of $y = k - x^2$, where k is some positive constant. If V is the midpoint of side BC of rectangle $ABCD$, and if the area of $ABCD$ is 16, what is the value of k?

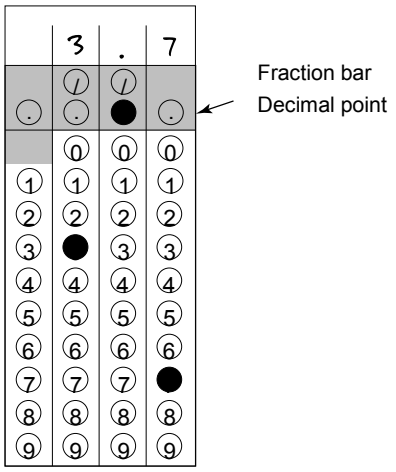
A. 2
B. $\sqrt{2}$
C. 4
D. $\sqrt{2}$

E. 8

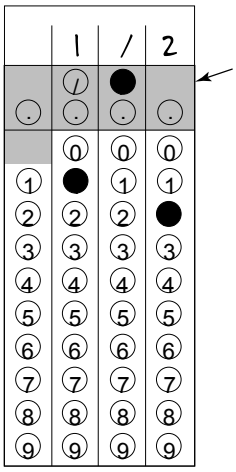
GO ON TO THE NEXT PAGE

Directions for Student-Produced Response Questions (Grid-ins): Questions 9–18 require you to solve the problem and enter your answer by carefully marking the circles on the special grid. Examples of the appropriate way to mark the grid follow.

Answer 3.7

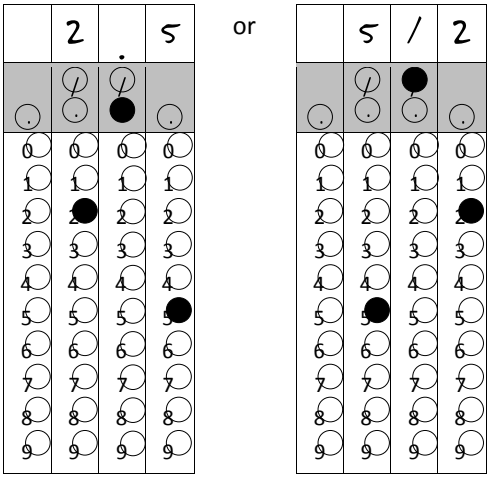


Answer 1/2



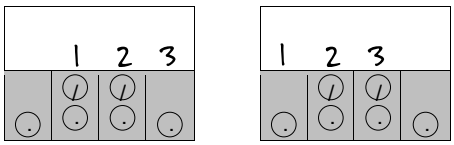
Answer 2 1/2

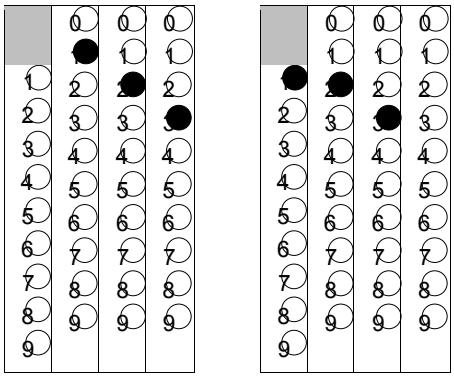
Do not grid-in mixed numbers in the form of mixed numbers. Always change mixed numbers to improper fractions or decimals.



Answer 123

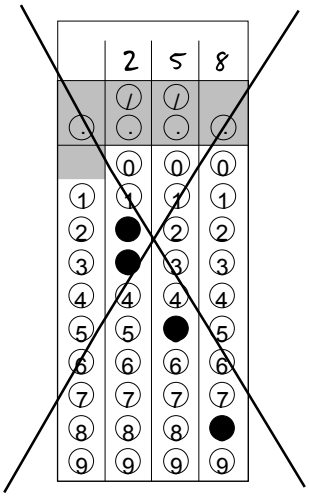
Space permitting, answers may start in any column. Each grid-in answer below is correct.





Note: Circles must be filled in correctly to receive credit. Mark only one circle in each column. No credit will be given if more than one circle in a column is marked. Example:

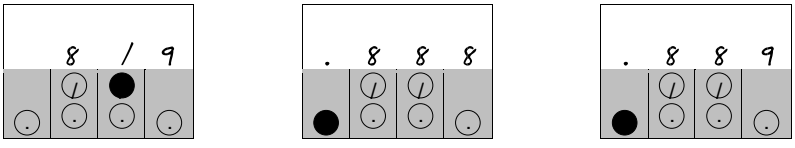
Answer 258 (no credit)

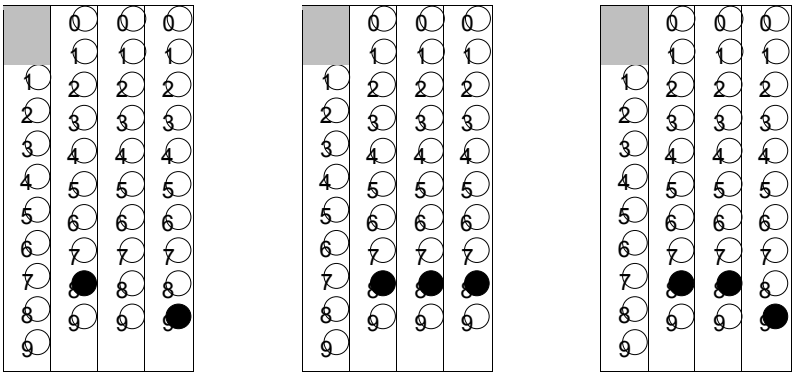


GO ON TO THE NEXT PAGE

Answer 8/9

Accuracy of decimals: Always enter the most accurate decimal value that the grid will accommodate. For example: An answer such as .8888 . . . can be gridded as .888 or .889. Gridding this value as .8, .88, or .89 is considered inaccurate and therefore not acceptable. The acceptable grid-ins of 8/9 are:





Be sure to write your answers in the boxes at the top of the circles before doing your gridding. Although writing out the answers above the columns is not required, it is very important to ensure accuracy. Even though some problems may have more than one correct answer, grid only one answer. Grid-in questions contain no negative answers.

9. Dividing a number by $\frac{2}{5}$ and then multiplying the result by $\frac{4}{3}$ gives the same result as just dividing the original number by what fraction?

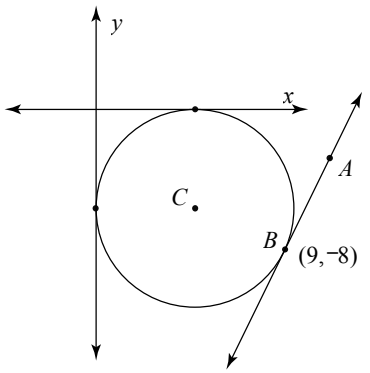
10. If

$2\underline{5}x = 3\underline{2}y$, what is the value of $\underline{x}\underline{y}$?

11. If $m^2 + n^2 = 29$ and if $mn = 7$, then the value of $(m + n)^2 =$

12. If $x^{\frac{-1}{3}} = 2$ and if $y^{\frac{1}{2}} = 2$, what is the value of xy?

13. What is the largest of 5 consecutive even integers

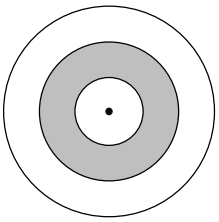


whose sum is 170?

14. In the figure above, the circle with center C and radius 5 is tangent to both the x and y axes. AB is tangent to the circle at point B. What is the slope of AB?

15. ABC in the xy-plane has vertices at A (5, 2), B (11, 2), and C (11, 6). What is the area of ABC?

16. If $m^2 + 2mn = 3n - 4w$, what is the value of n when $m = 3$ and $w = -5$?



17. The figure above consists of three circles having the same center. Their radii are 2, 3, and 4. The shaded area is what fraction of the area of the largest circle?

18. If $720 = a^m b^n c^r$, where a, b, and c are different positive prime integers, what is the value of $m + n + r$?

IF YOU FINISH BEFORE TIME IS CALLED, CHECK YOUR WORK ON THIS SECTION ONLY. DO NOT WORK ON ANY OTHER SECTION IN THE TEST.

STOP

Practice Test IIB

Time: 25 minutes

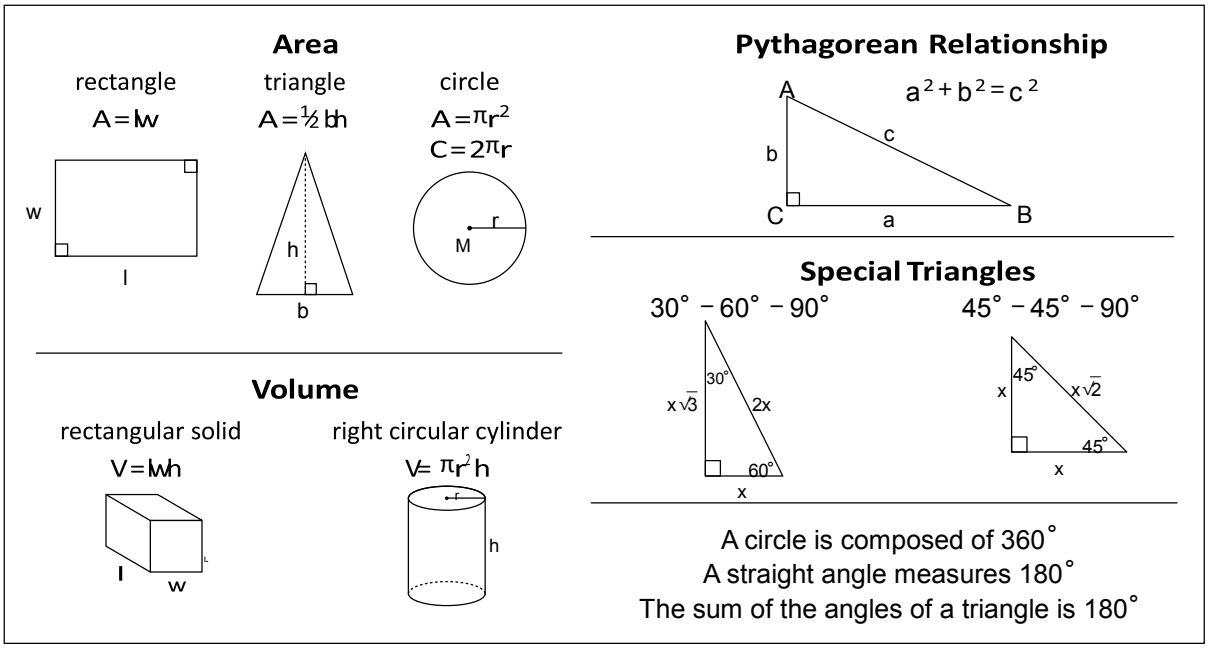
20 multiple-choice questions

Directions: Select the one correct answer of the five choices given and mark the corresponding circle on your answer sheet. Your scratch work should be done on any available space in the section.

Notes

1. All numbers used are real numbers.
2. Calculators may be used.
3. Some problems may be accompanied by figures or diagrams. These figures are drawn as accurately as possible EXCEPT when it is stated in a specific problem that a figure is not drawn to scale. The figures and diagrams are meant to provide information useful in solving the problem or problems. Unless otherwise stated, all figures and diagrams lie in a plane.

Data That Can Be Used for Reference



2, 3, 5, 8, 13, . . .

1. The first term in the sequence above is 2 and the second term is 3. For each term after the second term, its value represents the sum of the two terms preceding it. What is the tenth term of this sequence?

   A. 34
   B. 55
   C. 89
   D. 144
   E. 233

2. In the *xy*-plane, the line *l* is perpendicular to the graph of the equation $3x + 4y = 12$. Which of the following is the slope of line *l*?

   A. –4
   B. –3
   C. $\frac{-3}{4}$
   D. $\frac{4}{3}$
   E. 12

3. If $5(x + 3) = 17$, what is the value of *x*? **A.** $\frac{2}{5}$
   B. $\frac{5}{2}$
   C. $\frac{14}{5}$
   D. $\frac{22}{5}$
   E. 9

4. If $3(2x + 4)(5 – x) = 0$, what are all the possible values of *x*?

   A. 0 only
   B. –2 and 5 only
   C. 2 and –5 only
   D. 0, –2, and 5 **E.** 0, 2, and –5

5. For which of the following functions does *f*^-5h! *f*^ h5 ?

   A. *f x*^ h=|*x*|
   B. *f x*^ h= 7
   C. *f x*^ h= +*x* 3 5
   D. *f x*^ h= -*x* 2 3
   E. *f x*^ h= +6 *x* 4

6. When $x = 2$, what is the value of $x + \frac{1}{1} + + \frac{1}{x}\, x - \frac{1}{1}$?
   A. $\frac{1}{6}$
   B. $1\frac{2}{5}$
   C. $1\frac{5}{6}$
   D. 5 **E.** 11

7. Mark is taller than Rebecca, and Charles is shorter than Rebecca but taller than Harriet. If *m, r, c*, and *h* represent the heights of Mark, Rebecca, Charles, and Harriet respectively, which of the following correctly represent the order of their heights?

   A. $c < h < r < m$
   B. $r < c < h < m$
   C. $h < r < c < m$
   D. $c < h < r < m$
   E. $h < c < r < m$

8. The radius of one circle is $\frac{1}{3}$ the radius of a second circle. What is the ratio of the area of the smaller circle to the area of the larger circle?

   A. 1:9
   B. 1:3
   C. 3:1
   D. 6:1
   E. 9:1

9. If $2 \le x \le 6$ and $6 \le xy \le 30$, which of the following gives the range of all possible values of *y?*

   A. $\frac{1}{3}\# \#y \quad \frac{1}{8}$
   B. $\frac{1}{3}\# \#y \quad \frac{1}{5}$
   C. $4 \le y \le 24$
   D. $3 < y < 5$
   E. $3 \le y \le 5$

10. The quantity *m* varies inversely as the square of the quantity *r.* If $m = 9$ when $r = 4$, what is the value of *m* when $r = 6$?

    A. 4
    B. 6

PracticeTestII

C. 36
D. 64
E. 144

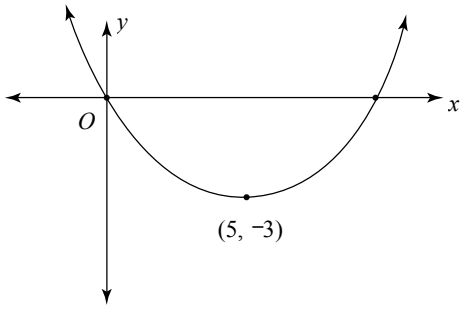
GO ON TO THE NEXT PAGE

11. If $xy\sqrt{x} = y$, with $y \neq 0$, and if $4m = 162$, what is the value of m?

A. $\frac{1}{2}$
B. 1
C. 2
D. 8
E. 16

12. What is the measure of the largest angle of a triangle, in which the degree measure of its angles have a ratio of 5:6:7?

A. 10
B. 35
C. 50
D. 70
E. 75



Note: Figure not drawn to scale.

13. For the parabola above, (5, –3) is its vertex. Which of the following are the x-coordinates of two points on the graph of the parabola for which their y-coordinates are equal?

A. 4 and 7
B. 2 and 9
C. 0 and 8 **D.** –1 and 11
E. 1 and 10

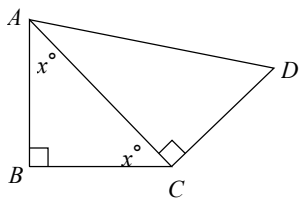
14. Mr. and Mrs. Franklin took their three children to a theatre to watch a movie. They select a row on the side having only five seats. If each of the parents must sit at either end of the row, in how many different ways can the Franklin family be seated in the five seats?

A. 3
B. 6
C. 12

D. 24
E. 120

15. How many inches are there in a distance of Y yards, F feet, and I inches?

A. $3Y + F + 12I$ **B.** $36Y + F + 12I$
C. $3Y + 12F + I$
D. $36Y + 12F + I$ **E.** $3Y + 12F + 12I$

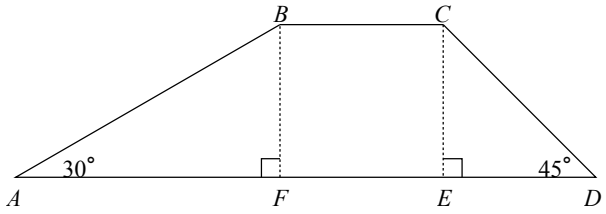


16. In the figure above, $\overline{AB} = \overline{BC}$ and $\overline{AC} = \overline{CD}$. If the length of $AB = 2$ and the length of $BC = 2$, what is the length of AD?

A. $2\sqrt{2}$ (approximately 2.82)
B. $2\sqrt{3}$ (approximately 3.46)
C. 4
D. $3\sqrt{2}$ (approximately 4.24)
E. $2\sqrt{5}$ (approximately 4.47)

17. The perimeter of an equilateral triangle is $\frac{9}{2}$

18. What is the area of the triangle? **A.** $\frac{9\sqrt{2}}{2}$
B. $9\sqrt{2}$
C. $9\sqrt{3}$
D. 18
E.



Note: Figure not drawn to scale.

18. In the figure above, $BCAD$. What is the ratio of the area of ABF to the area of CED?

A. $\sqrt{3}:\sqrt{2}$
B. $\sqrt{2}:1$
C. $3:2$
D. $\sqrt{3}:1$
E. $2:1$

19. If m and r are constants and if $(x + m)(x + r) = x^2 + cx + w$, where c and w are constants, what is w in terms of m and r?

A. r

B. m

C. mr

D. $m + r$

E. It cannot be determined from the given information.

20. Let the function f be defined by $f(x) = x^2 - 2x$. For which values of m will $f(2m) = 15$?

A. –2 only
B. $\frac{-3}{2}$ and $\frac{5}{2}$
C. 3 and –5
D. –3 and 5
E. 3 only

IF YOU FINISH BEFORE TIME IS CALLED, CHECK YOUR WORK ON THIS SECTION ONLY. DO NOT WORK ON ANY OTHER SECTION IN THE TEST.

Practice Test IIC

Time: 20 minutes

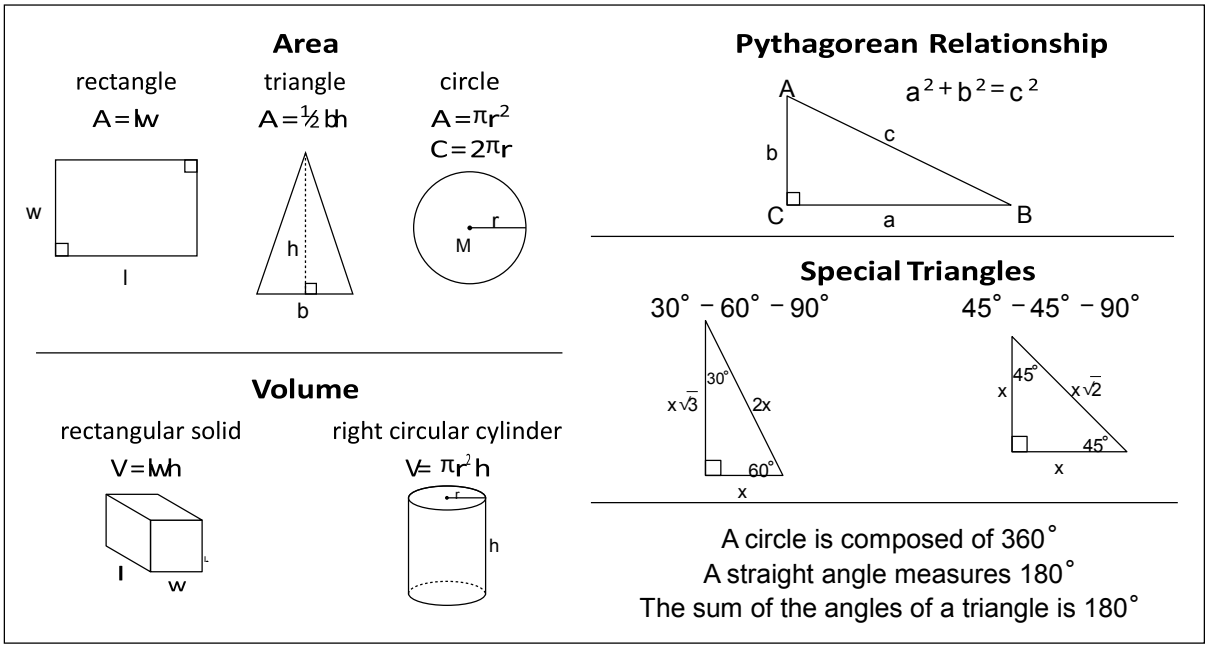
16 multiple-choice questions

Directions: Select the one correct answer of the five choices given and mark the corresponding circle on your answer sheet. Your scratch work should be done on any available space in the section.

Notes

1. All numbers used are real numbers.
2. Calculators may be used.
3. Some problems may be accompanied by figures or diagrams. These figures are drawn as accurately as possible EXCEPT when it is stated in a specific problem that a figure is not drawn to scale. The figures and diagrams are meant to provide information useful in solving the problem or problems. Unless otherwise stated, all figures and diagrams lie in a plane.

Data That Can Be Used for Reference



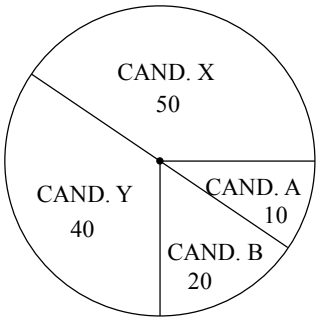
1. Two positive integers are called "relatively prime" if their only common factor is 1. Which of the following pair of numbers is "relatively prime?"

   A. 6 and 9 **B.** 10 and 5
   C. 8 and 15
   D. 12 and 4
   E. 9 and 12

2. If the volume of a cube is 8, what is its total surface area?

   A. 6
   B. 8
   C. 16
   D. 18
   E. 24

3. The graph above shows the number of votes received by each of four candidates in an election. What fraction of the votes did candidate *Y* receive?

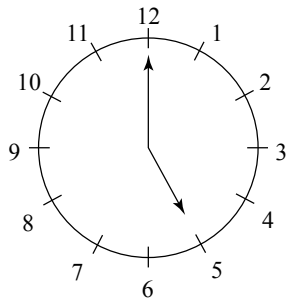


   A. $\frac{1}{6}$
   B. $\frac{1}{4}$
   C. $\frac{1}{3}$
   D. $\frac{1}{2}$
   E. $\frac{2}{5}$^

h=-3x², then the value of *f*(–2) =

4. If $f(x) = 7 - x$

   A. $\frac{-12}{5}$
   B. $\frac{-4}{3}$
   C. $\frac{6}{7}$
   D. $\frac{4}{3}$ **E.** $\frac{12}{5}$



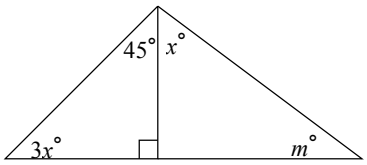
5. At 5:00pm, what is the degree measure of the angle between the hour and minute hands on the traditional clock above?

   A. 75°
   B. 115°
   C. 120°
   D. 150°
   E. 165°

6. The denominator of a fraction is 3 more than its numerator. If the fraction is equal to $\frac{14}{35}$, what is the numerator of the fraction?

   A. 2
   B. 3
   C. 5
   D. 6
   E. 7

GO ON TO THE NEXT PAGE

7. In 

Note: Figure not drawn to scale.
the figure above, what is the value of *m?*

A. 15
B. 30
C. 45
D. 60
E. 75

8. If $0 < x < 1$, which of the following statements must be true?

I. $\frac{1}{x} > x$

II. $x^2 < x$

III. $x^3 - x^2 > 0$

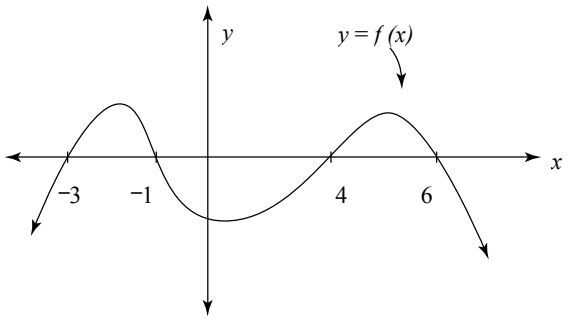
A. I only **B.** II only
C. III only
D. I and II only **E.** II and III only

9. The average of two numbers is *x.* If one of the numbers is $3m - 5$, then the other number, in terms of *x* and *m,* is

A. $\frac{x + -3m\ \ 5}{2}$
B. $6m - 10 - x$
C. $6m - 5 - x$
D. $\frac{6m - 10}{x}$
E. $6m - 10 + x$

10. In the *xy*-plane, the graphs of $y = 2x + 7$ and $y = -3x + r$ intersect at the point $(-2, m)$. What is the value of *r?*

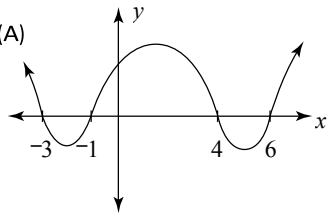
A. –3
B. –1
C. 2
D. 3
E. 4



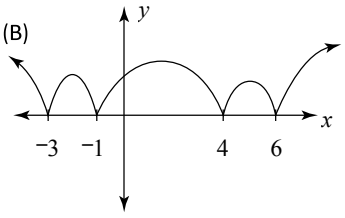
Note: Figure not drawn to scale.

11. The graph above is that of the equation $y = f(x)$. Which of the following could be the graph of $y = |f x^{\wedge} h|$?

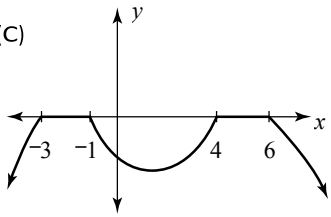
(A)



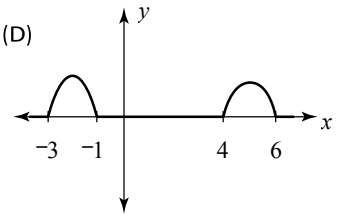
(B)



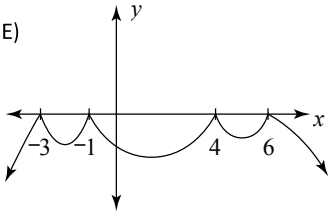
(C)



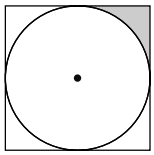
(D)



(E)



12. The radius of a right circular cylinder is doubled, and its height is tripled. What is the ratio of the volume of the original cylinder to the volume of the new larger cylinder? **A.** $\frac{1}{12}$ **B.** $\frac{1}{6}$ **C.** $\frac{1}{3}$ **D.** $\frac{1}{2}$ **E.** 6



13. In the figure above, a circle is inscribed within a square having a perimeter of 32. What is the area of the shaded region?

A. $64 - 16\pi$ **B.** $32 - 8\pi$ **C.** $16 - 4\pi$ **D.** $8 - 2\pi$ **E.** $4 - \pi$

14. In the *xy*-plane, how many different integer pairs (x, y) are in the solution set of $|x| + |y| \leq 2$?

A. 4
B. 5
C. 8
D. 12
E. 13

15. The sum of three consecutive even integers is 72. If x represents the smallest, y the middle, and z the greatest of these even integers, which of the following equations could be used to represent the first sentence of this problem?

I. $3x + 6 = 72$
II. $3y = 72$
III. $3z - 6 = 72$

A. I only **B.** II only **C.** I and II only **D.** I and III only **E.** I, II, and III

16. If $\frac{x+4}{2}$ is an integer, and if $\frac{y-3}{2}$ is an integer, then xy must be

A. an even integer **B.** a negative integer **C.** an odd integer **D.** a multiple of 12 **E.** a positive integer

IF YOU FINISH BEFORE TIME IS CALLED, CHECK YOUR WORK ON THIS SECTION ONLY. DO NOT WORK ON ANY OTHER SECTION IN THE TEST.

STOP

Scoring Practice Test II

Answer Key for Practice Test II

Practice Test IIA

1. B 2. E 3. E 4. D 5. C 6. B 7. D 8. A 9. E 10. A 11. B 12. D 13. D 14. C 15. D 16. B 17. D 18. D 19. C 20. B

Practice Test IIB

1. D 2. D 3. A 4. B 5. C 6. C 7. E 8. C 9. $\frac{3}{10}$ 10. $\frac{15}{14}$ or 1.07 11. 43 12. $\frac{1}{2}$ or .5 13. 38 14. $\frac{4}{3}$ or 1.33 15. 12 16. $\frac{11}{3}$ or 3.66 or 3.67 17. $\frac{5}{16}$ or .312 or .313 18. 7

Practice Test IIC

1. C 2. E 3. C 4. B 5. D 6. A 7. E 8. D 9. B 10. A 11. B 12. A 13. C 14. E 15. E 16. A

PracticeTestII

Analyzing Your Test Results

The charts on the following pages should be used to carefully analyze your results and spot your strengths and weaknesses. The complete process of analyzing each subject area and each individual problem should be completed for each practice test. These results should then be reexamined for trends in types of errors (repeated errors) or poor results in specific subject areas. This reexamination and analysis is of tremendous importance to you in ensuring maximum test preparation benefit.

Mathematics Analysis Sheet

Section A	*Possible*	*Completed*	*Right*	*Wrong*
Multiple Choice	8			
Grid-Ins	10			
Subtotal	18			
Section B	*Possible*	*Completed*	*Right*	*Wrong*
Multiple Choice	20			
Subtotal	20			
Section C	*Possible*	*Completed*	*Right*	*Wrong*
Multiple Choice	16			
Subtotal	16			
Overall Math Totals	54			

Analysis/Tally Sheet for Problems Missed

One of the most important parts of test preparation is analyzing why you missed a problem so that you can reduce the number of mistakes. Now that you have taken the practice test and checked your answers, carefully tally your mistakes by marking them in the proper column.

	Reason for Mistakes				
	Total Missed	*Simple Mistake*	*Misread Problem*	*Lack of Knowledge*	*Lack of Time*
Section A : Math					
Section B : Math					
Section C : Math					
Total Math					

Reviewing the preceding data should help you determine why you are missing certain problems. Now that you've pinpointed the type of error, compare it to other practice tests to spot other common mistakes.

Complete Answers and Explanations for Practice Test II

Practice Test IIA Explanations

1. **B.** To solve the equation:

$$7x - 5 = 4x - 17$$

$7x - 5 - 4x = 4x - 17 - 4x$ Subtract $4x$ from each side to get variable on just one side.

$$3x - 5 = -17$$

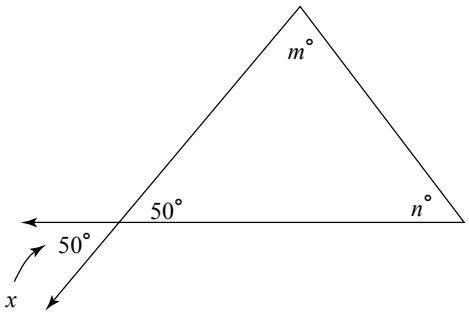
$3x - 5 + 5 = -17 + 5$ Add 5 to each side to isolate variable term.

$$3x = -12$$

$\frac{3x}{3} = \frac{-12}{3}$ =Divide both sides by 3.

$$x = -4$$

2. **E.**



In the figure, the two angles marked 50° are vertical angles, so they are the same measure. The sum of the angles in the triangle must be 180°, so you have:

$$50 + m + n = 180$$

$50 + m + n - 50 = 180 - 50$ Subtract 50 from each side.

$$m + n = 130$$

3. **E.** When the graph of the equation $y = 3x - 12$ crosses the x-axis, its y-coordinate will be 0. So you then have:

$$0 = 3x - 12$$

$0 + 12 = 3x - 12 + 12$ Add 12 to both sides of the equation.

$$12 = 3x$$

$\frac{12}{3} = \frac{3x}{3}$

$$4 = x$$

4. **D.** Our given relationship reads something like the following: "average of $5x$ and $3y$ is equal to product of x and y, then 4 less than this." Translating this into an algebraic equation, you get:

$$\frac{5x + 3y}{2} = xy - 4$$

5. **C.** Just try different values of n and see what you get for the last digit of the answer.

For $n = 1$: $3^1 = 3$; number ends in a digit of 3

For $n = 2$: $3^2 = 9$; number ends in a digit of 9

For $n = 3$: $3^3 = 27$; number ends in a digit of 7

For $n = 4$: $3^4 = 81$; number ends in a digit of 1 So

the number cannot end in a digit of 5, Choice **C.**

6. **B.** 20% off means that $\frac{4}{5}$ of the price remains.

   25% off means that $\frac{3}{4}$ of that price remains.

   So a discount of 20% followed by a discount of 25% would leave $\frac{4}{5} \cdot \frac{3}{4} = \frac{3}{5}$ of the original price, meaning $\frac{2}{5}$, or 40% has been discounted.

7. **D.** To solve an equation of the form "*stuff*" $= N$, break it into two parts:

   "stuff" $= -N$ or "stuff" $= N$

   So the given equation $2x - 3 = 7$ turns into the 2 parts:

$$\frac{-4}{2} \qquad\qquad \frac{10}{2}$$

$2x - 3 = -7$ or $2x - 3 = 7$

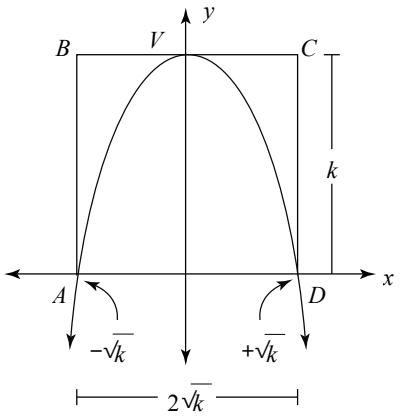
$2x - 3 + 3 = -7 + 3$ or $2x - 3 = 7 + 3$ Add 3 to both sides.

$2x = -4$ $\qquad$ $2x = 10$

$\frac{2x}{2} = \frac{2x}{2}$ = Divide both sides by 2.

$x = -2$ or $x = 5$

8. **C.** By setting $x = 0$ in the given equation $y = k - x^2$, you get that $y = k$ is the y-intercept of the graph of this equation. So the parabola crosses the y-axis at k. Thus the height of the rectangle $ABCD$ is also just k, as shown in the figure below.



   By setting $y = 0$ in the given equation, you can find where the graph of the parabola crosses the x-axis.

$y = k - x^2$

$0 = k - x^2$

$0 + x^2 = k - x^2 + x^2$ Add x^2 to both sides of the equation.

$x^2 = k$

therefore $x = \pm \sqrt{k}$

So you know that the parabola crosses the x-axis at $-\sqrt{k}$ on the left and $+\sqrt{k}$ on the right.

Thus the base of the rectangle is $2\sqrt{k}$.

The area of the rectangle ABCD is given as 16, so you have:

$\text{Area}_{\text{rect.}} = \text{base} \times \text{height}$

$16 = 2\sqrt{k} \cdot k$ Substitute the base and height.

$\frac{16}{2} = \frac{2\sqrt{k} \cdot k}{2}$ Divide both sides by 2.

$8 = \sqrt{k} \cdot k$

$8^2 = (\sqrt{k} \cdot k)^2$ Square both sides to get rid of the radical.

$64 = k \times k^2$

$64 = k^3$

$4 = k$

9. $\frac{3}{10}$

Letting N be the given number, you have:

$\frac{2}{5} \quad \frac{N}{3} \cdot 4 = N \cdot \frac{5}{2} \cdot \frac{4}{3} = N \cdot \frac{10}{3}$

So after dividing your number N by $\frac{2}{5}$ and then multiplying by $\frac{4}{3}$, you end with just the number N multiplied by $\frac{10}{3}$.

The question asks what you should divide the original number N by to get $N \cdot \frac{10}{3}$.

If you divide N by $\frac{3}{10}$, you will get $N = N \cdot \frac{10}{3}$. So divide by $\frac{3}{10}$.

10. $\frac{15}{14}$ **or 1.07**

Starting with the original proportion:

$\frac{5}{7x} = \frac{2}{3y}$

$5 \cdot 3y = 7x \cdot 2$ Take the diagonal products (cross-multiply).

$15y = 14x$ $\frac{15y}{y} = \frac{14x}{y}$ Divide by y, since you want to get $\frac{x}{y}$.

$15 = 14\frac{yx}{}$

$\frac{1}{14} : 15 = 14^{\frac{1}{}}: \frac{14}{y}\frac{x}{}$ Multiply both sides by $14^{\frac{1}{}}$.

$14\underline{15} = \underline{x}y$

$\underline{x} = 1\ 07.$

You could also write the answer as a decimal: y

11. **43**

First, expand the term $(m + n)^2$:

$(m + n) = (m + n)(m + n)$

$= m^2 + 2mn + n^2$

$= m^2 + n^2 + 2(mn)$ Reordered terms for purpose of next step.

$= 29 + 2(7)$ It is given that $m^2 + n^2 = 29$ and $mn = 7$.

$= 29 + 14 = 43$

12. $\frac{1}{2}$ **or .5**

First, solve the given equations for x and y; then you can find the value of xy.

$x^{\frac{-1}{3}} = 2$

a

$_{-3}x_1 =$

2_{-3}

$x_{-3^{\frac{1}{}}}k = 2^{-3}$. You have taken the –3 power of both sides so that the exponent of x on the left will then be just 1.

$\frac{1}{2^3}$ x =. Remember that, in general, $^{number}h^{negative} = ^{\frac{1}{}}h_{positive}$.

number

$x = \frac{1}{8}$

Next, solve for y.

$y^{\frac{1}{2}} = 2$

2

$a\ k y^{\frac{1}{2}} = 2^{2}$. Take the second power of both sides; you want just y^1 on the left.

$y = 4$

Finally, $xy = xy = \frac{1}{8} : 4 = \frac{1}{2}$

You could also write the decimal .5

13. **38**

Let n = first even integer. Then n

+ 2 = second even integer, so n +

4 = third even integer, and n + 6

= fourth even integer, with n + 8

= fifth even integer.

Since their sum is 170, you have the equation:

$n + (n + 2) + (n + 4) + (n + 6) + (n + 8) = 170$

$5n + 20 = 170$ Combine like terms on the left side.

$5n + 20 - 20 = 170 - 20$ Subtract 20 from both sides.

$5n = 150$

$\frac{5n}{5} = \frac{150}{5}$

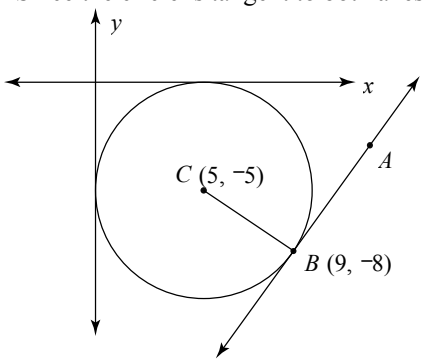
$n = 30$

So your five consecutive even integers are 30, 32, 34, 36, and the largest one 38.

Another shorter approach works as follows: Divide the sum of the integers by the number of integers . . . so $170 \div 5 = 34$, which gives the middle of our list of numbers. So the two above this are 36, and the largest 38.

14. **$\frac{4}{3}$ or 1.33**

Since the circle is tangent to both axes, located in the fourth quadrant, and it has a radius of 5, you know that its



$\overleftrightarrow{}$ center has coordinates (5, –5) as in the figure above. Since AB is tangent to the circle at point B, you also know

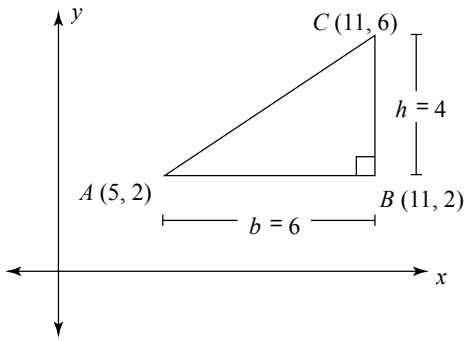
$\overleftrightarrow{}$ $\overleftrightarrow{}$

that $AB = CB$. Remembering that the slopes of perpendicular lines have opposite reciprocal slopes (for example, $\frac{2}{3}$ and $\frac{-3}{2}$); you have to find only the slope of $\overline{CB}$ and take its opposite reciprocal.

$slope_{\overline{BC}} = \frac{-8 - -5}{9 - 5} = \frac{-3}{4}$ So the slope of AB is just $\frac{4}{3}$ or 1.33

15. **12**

Below is a rough sketch of the points in the xy-plane.



Since points A and B have the same y-coordinate, they lie on a horizontal line segment, and since points B and C have the same x-coordinate, they lie on a vertical line segment as shown in the figure above.

You can easily see that the base of the triangle is just 6 and height is just 4.

Therefore, its area = $\frac{1}{2}bh = \frac{1}{2}: 6\ 4: = 12$.

16. **$\frac{11}{3}$ or 3.66 or 3.67**

$m^2 + 2mn = 3n - 4w$

$3^2 + (2 \cdot 3 \cdot n) = 3n - (4 \cdot -5)$ Substituted given values of $m = 3$ and $w = -5$.

$9 + 6n = 3n + 20$

$9 + 6n - 3n = 3n + 20 - 3n$ Subtract $3n$ to get the variable on just one side.

$9 + 3n = 20$

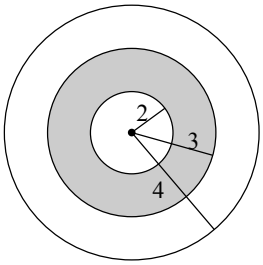
$9 + 3n - 9 = 20 - 9$ Subtract 9 from each side of the equation.

$3n = 11$

$\frac{3n}{3} = \frac{11}{3}$ Divide both sides by 3.

$n = \frac{11}{3}$ or 3.66 or 3.67

17. **$\frac{5}{16}$ or .312 or .313**



Using the figure above, you see that the shaded area is just the difference between the areas of the medium and small circles:

$\text{Area}_{\text{shaded}} = \text{Area}_{\text{med. circle}} - \text{Area}_{\text{small circle}}$

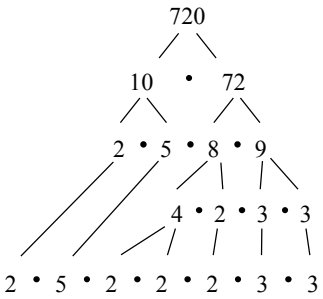
$= \pi\ (3)^2 - \pi\ (2)^2 = 9\pi\ - 4\pi\ = 5\pi$

Also, $\text{Area}_{\text{big circle}} = \pi\ (4)_2 = 16\pi$

The requested ratio is: $\frac{AREA_{\text{shaded.}}}{AREA_{\text{big circle}}} = \frac{5\pi}{16\pi} = \frac{5}{16}$ or .312 or .313

18. **7**

Using a "factor tree," you find the prime factorization of 720 in the form of $a^m \times b^n \times c^r$.



Since $720 = 2^4 \times 3^2 \times 5^1$, the desired numbers *m, n*, and *r* are just the exponents 4, 2, and 1.

If you wrote the factored form as $720 = 3^2 \times 2^4 \times 5^1$ instead, the desired *m, n*, and *r* would still be the exponents 2, 4, and 1.

Since you are finding the sum of *m, n*, and *r,* the order of the exponents makes no difference.

So, in any order, $m + n + r = 4 + 2 + 1 = 7$ always.

Practice Test IIB Explanations

1. **D.** The first few terms of the sequence are 2, 3, 5, 8, 13, . . .

   The third term, 5, is the sum of 2 and 3, the two terms preceding it.

   The fourth term, 8, is the sum of 3 and 5, the two terms preceding it.

   The fifth term, 13, is the sum of 5 and 8.

   Continuing in this manner, you get:

   The sixth term = 8 + 13 = 21. The sequence is now 2, 3, 5, 8, 13, 21.

   The seventh term = 13 + 21 = 34. The sequence is now 2, 3, 5, 8, 13, 21, 34.

   The eighth term = 21 + 34 = 55. The sequence is now 2, 3, 5, 8, 13, 21, 34, 55.

   The ninth term = 34 + 55 = 89. The sequence is now 2, 3, 5, 8, 13, 21, 34, 55, 89.

   The tenth term = 55 + 89 = 144. The sequence is now 2, 3, 5, 8, 13, 21, 34, 55, 89, 144.

2. **D.** To find the slope of $3x + 4y = 12$, solve for *y,* expressing the equation in slope-intercept form:

   $3x + 4y = 12$

   $3x + 4y - 3x = 12 - 3x$ Subtract $3x$ from each side to isolate the *y* term.

   $4y = 12 - 3x$

   $\frac{4y}{4} = \frac{12}{4} - \frac{3x}{4}$ = - Divide all terms by 4 to get *y* by itself.

   $y = -3\frac{3}{4}x$, or in slope-intercept form, $y = \frac{-3}{4}x + 3$.

   The slope of the line above is $\frac{-3}{4}$. Since perpendicular lines have opposite reciprocal slopes, the slope of line *l* is $\frac{4}{3}$.

3. **A.** To solve this equation:

   $5(x + 3) = 17$

   $5x + 15 = 17$ Distribute the 5 on the left.

   $5x + 15 - 15 = 17 - 15$ Subtract 15 from each side to isolate the variable term.

   $5x = 2$

   $\frac{5x}{\frac{2}{5}} = \frac{2}{5}$ =Divide both sides of equation by 5. $5x =$

4. **B.** If $3(2x + 4)(5 - x) = 0$, then one of the two factors containing *x* could be 0.

   So either $2x + 4 = 0$ or $5 - x = 0$

   $2x = -4$ or $5 = x$

   $x = -2$ or $x = 5$

5. **C.** To determine if $f(-5)$ does NOT equal $f(5)$, substitute -5 for x and 5 for x to see if the answers are the same. **A.**

   For $f(x) = |x|$, You can easily see that when either -5 or 5 are put in for x, the answer is 5 both times.

   B. For $f(x) = 7$, the answer is 7 no matter what the value of x; so once again the answers are the same: 7 both times.

   C. For $f(x) = x^3 + 5$, you get:

   $f(-5) = (-5)^3 + 5$ and $f(5) = (5)^3 + 5$

   $= -125 + 5 = 125 + 5$

   $= -120 \neq 130$

   So in this case, $f(-5) \neq f(5)$; thus Choice **C** is the answer.

6. **C.**

$$\frac{1}{x+1} + \frac{1}{x} - \frac{1}{x-1}$$

$$= \frac{1}{2+1} + \frac{1}{2} - \frac{1}{2-1}$$ Substitute 2 for each x in the expression in the first line.

$$= \frac{1}{3} + \frac{1}{2} - 1$$

$$= \frac{2}{6} + \frac{3}{6} - \frac{6}{6}$$ Change all fractions to common denominator of 6.

$$= \frac{-1}{6} = -\frac{1}{6}$$

7. **E.** Mark is taller than Rebecca → $m > r$ or can also be written as $r < m$ (note that all answer choices involve $<$, not $>$).

   Charles is shorter than Rebecca → $c < r$.

   but Charles is taller than Harriet → $h < c$.

   Putting these three inequalities together: $h < c$ and $c < r$ and $r < m$, you end up with the compound inequality: $h < c < r < m$, which is Choice **E.**

8. **A.** If you let the radius of the larger circle be r, then the radius of the smaller circle is $\frac{1}{3}r$. The requested ratio is then:

$$\frac{AREA_{small}}{AREA_{large}} = \frac{\pi\left(\frac{1}{3}r\right)^2}{\pi r^2} = \frac{\pi\left(\frac{1}{9}r^2\right)}{\pi r^2} = \frac{1}{9}$$

   You could also have used 3 for the radius of the large circle and 1 for the radius of the small circle and obtained the same result.

9. **E.** The second inequality is: $6 \leq xy \leq 30$

$$\frac{1}{m^2} = \frac{4}{2}$$ Simplified each square root in previous equation.

$$m^2 = 2$$

$$m = 1$$

The first inequality is: $2 \le x \le 6$

If you divide these inequalities, term by term, you obtain: $3 \le y \le 5$, which is Choice **E.**

10. **A.** m varies inversely as square of $r \rightarrow m = \frac{k}{r^2}$, where k is some constant.

Substituting the given values $m = 9$ and $r = 4$, you then get: $9 = \frac{k}{4^2}$.

$$9 = \frac{k}{16}$$

$16 \cdot 9 = 16 \cdot \frac{k}{16}$ Multiply both sides by 16.

$$144 = k$$

Therefore, the relationship between m and r can be expressed as: $m = \frac{144}{r^2}$.

With $r = 6$, you have: $m = \frac{144}{6^2} = \frac{144}{36} = 4$

11. **B.** With the operation defined by the equation $x \cdot y = \sqrt{x}$, you can solve the equation:

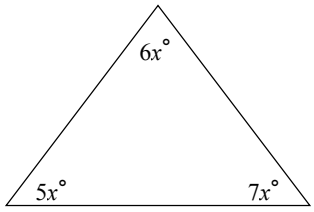
$4 \cdot m = 162$

$\sqrt{4} \quad \sqrt{16}$

$m = 2$

D.

12. Since the ratio of the angle measures is 5:6:7, you can label the angle measures of the triangle with $5x$, $6x$, and $7x$ as in the figure below.



Then, you have the equation: $5x + 6x + 7x = 180$

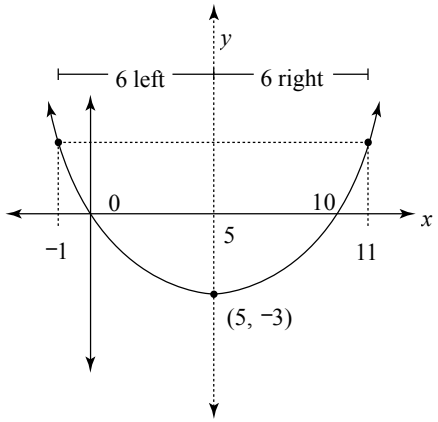
$18x = 180$ Combined like terms on left.

$\frac{18x}{18} = \frac{180}{18}$ =Divide both sides by 18.

$18\,x = 10$

But you want the measure of the largest angle of the triangle. So you find the value of $7x = 7(10) = 70$.

13. **D.**



In the figure above, the parabola has vertex at the point (5, –3). The dashed vertical line passing through 5 on the x-axis is called the "axis of symmetry" for the parabola. The points on the parabola to the left of the axis of symmetry are just mirror images of the corresponding points on the parabola to the right of the axis of symmetry. For example, you see that the parabola passes through the origin, which is 5 units left of the axis of symmetry; therefore, the parabola must cross the x-axis at 10 also, since that is just 5 units to the right of the axis of symmetry. So to answer the given question, you are looking for two numbers that are same distance—left and right—from 5. Choice **D** has just such a pair of numbers: –1 and 11. –1 is 6 units left, and 11 is 6 units right of the axis of symmetry as shown in the figure above.

14. **C.** Below is a series of five blanks, one for each seat in our row of five seats: $\underline{\quad}\ \underline{\quad}\ \underline{\quad}\ \underline{\quad}\ \underline{\quad}$ $P\ C\ C\ C\ P$

Under each blank is the letter P for parent, or C for child. The person to sit at the left end of the row can be chosen two ways (one of the two parents) and the person to sit at the other end can be chosen only one way (the remaining parent must sit there). So your series of blanks now looks like:

2 1

P C C C P

Next you need to seat the three children. The first child seat can be filled three ways (any one of the three children), then the next seat only two ways (one of the remaining two children), and finally the last child seat can only be filled one way (the last un-chosen child must sit there). Your series of seating choices now is complete:

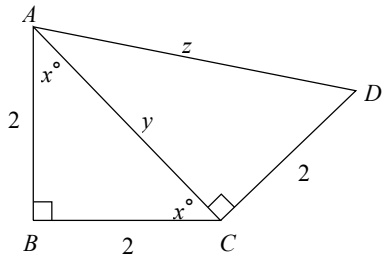
*P*2 3 2 1 1*C C C P* . Your final answer is just the product of these numbers; 2 × 3 × 2 × 1 × 1 = 12

15. **D.** To change yards to inches, multiply by 36 (1 yard = 36 inches) To change feet to inches, multiply by 12 (1 foot = 12 inches)

So Y yards = $36Y$ inches, F feet = $12F$ inches.

Therefore a distance of Y yards, F feet, and I inches = $36Y + 12F + I$ inches

16. **B.**



In the figure above, ABC is an isosceles right triangle. Since $AB = 2$, then $BC = 2$ also. Using the pattern for an isosceles right triangle, $x, x, x\sqrt{2}$, you know that $AB = 2\sqrt{2}$, labeled y in the diagram. ACD is a right triangle, so you use the Pythagorean theorem to find the length of AD:

$y^2 + 2^2 = z^2$

`2 √2j² + =2 ² z ² Replace y with $2\sqrt{2}$.

$8 + 4 = z^2$

$12 = z^2$

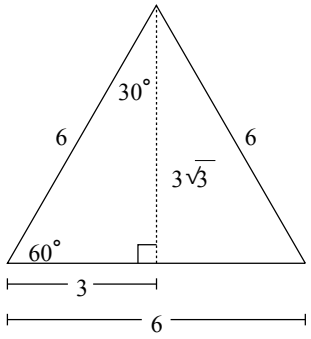
$\sqrt{\quad}$ $12 = z$ Take the square root of both sides.

$\sqrt{\ \S}$ $4\ 3 = z$

$2\sqrt{3} = z$

So the length of $\overline{AD}$ is $2\sqrt{3}$.

17. **D.** Since the triangle is equilateral, each angle has a measure of 60°; since the equilateral triangle has a perimeter of 18, the length of each side is 6.



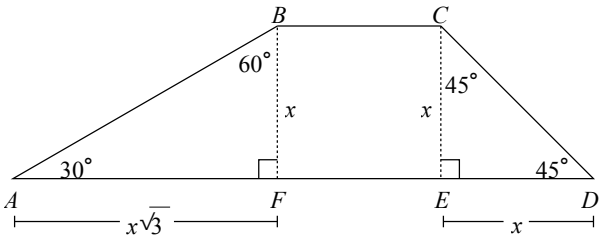
D.

Referring to the figure above, the altitude drawn to the base of the triangle will bisect the base and bisect the angle at the top of the triangle, forming two 30°-60°-90° triangles.

Using your $3\sqrt{}$ pattern for this type of triangle, you can find the height of the equilateral triangle to be $3\sqrt{3}$; the base of the equilateral triangle is obviously 6.

The area of the triangle is then $\frac{1}{2}bh = \frac{1}{2} \cdot 6 \cdot 3\sqrt{3} = 9\sqrt{3}$.

18.



In the figure above, let the height $\overline{CE}$ of the isosceles right CED be x. Then the base $\overline{ED}$ will also be x. Since $\overline{CE}$ is x, $\overline{BF}$ will also be x and this will be the height of AFB. Notice that AFB is a 30°-60°-90°triangle, so using the $3\sqrt{}$ pattern, you find the base AF of this triangle is just $x\sqrt{3}$. Now that you have the base and height for each triangle, you can find the requested ratio using the area of triangle formula $\frac{1}{2}bh$.

$AREA_{\triangle ABF} = \frac{1}{2} \cdot x \cdot x\sqrt{3} = \frac{\sqrt{3}}{2}x^2$ or $\frac{1}{2}\sqrt{3}x^2$

$AREA_{CED} \quad \frac{1}{2} \cdot x \cdot x = \frac{1}{2}x^2$

19. **C.** You are told that the given expressions are equal, so you have:

$x^2 + cx + w = (x + m)(x + r)$

$x^2 + cx + w = x^2 + rx + mx + mr$ Expand the right side (FOIL).

$x^2 + cx + w = x^2 + (r + m)x + mr$ Factor x out of the 2 middle terms.

$x^2 + cx + w = x^2 + (r + m)x + mr$ Just write in left side of the equation.

$x^2 + + = + \underline{c}x \quad \underline{w} \quad x^2 \grave{} \underline{r + m}jx + \underline{mr}$ Add underlining for the next step.

For the left side and right side polynomials to be equal, the coefficients of their respective terms must be equal. So you have: $c = r + m$; coefficient of the x term on left = coefficient of x term on right $w = mr$; constant term on left = constant term on right

You can now find the requested ratio: $\frac{w}{c} = \frac{mr}{r + m}$, which is the same as $\frac{mr}{m + r}$, Choice **C.**

20. **B.** Using the given function $f(x) = x^2 - 2x$, you have the following equation to solve:

$f(2m) = 15$

$(2m)^2 - 2(2m) = 15$ — Put $2m$ in for x in the given function.

$4m^2 - 4m = 15$

$4m^2 - 4m - 15 = 15 - 15$ — Subtract 15 from each side; you want to set the equation equal to 0 and then factor it later.

$4m^2 - 4m - 15 = 0$

$(2m + 3)(2m - 5) = 0$ — Factor the left hand side.

$2m + 3 = 0$ and $2m - 5 = 0$ — Set each factor equal to 0.

$2m = -3$ and $2m = 5$

$m = \frac{-3}{2}$ and $m = \frac{5}{2}$

Practice Test IIC Explanations

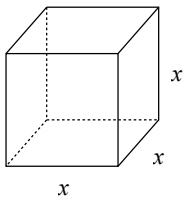
1. **C.** Checking each of the answer choices, you are looking for a pair of numbers whose only common factor is 1.

   A. 6 and 9 have common factors of 1 and 3. So they are NOT relatively prime.

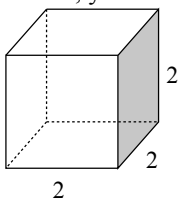
   B. 10 and 5 have common factors of 1 and 5. So they are NOT relatively prime.

   C. 8 and 15 only have a common factor of 1. So these ARE relatively prime.

2. **E.**

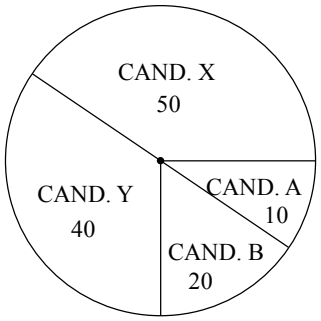


   To find the volume of the cube in the figure above, you find the product of the length, width, and height, getting volume equals x^3. Since you are told the volume is 8, you have $x^3 = 9$, so $x = 2$.



   In the figure above, the total surface area will be the area of the shaded side square multiplied by 6, since there are 6 equal faces to the cube. The area of the shaded square is $2 \times 2 = 4$, so the total area is $6 \times 4 = 24$.

3. **C.**



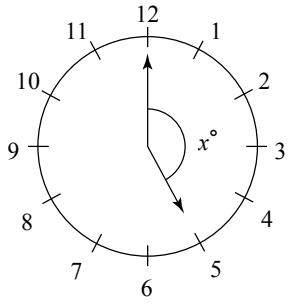
D.

From the circle graph above, the total number of votes cast was 50 + 40 + 20 + 10 = 120. Candidate *Y* received 40 of those votes, so candidate *Y* received $\frac{40}{120} = \frac{1}{3}$ of the votes.

4. **B.** Using the given function $f(x) = -7 - 3x^2$, you find $f(-2)$ by putting –2 in place of *x:*

$$f(-2) = -7 - 3(-2)^2 = -7 - 3 \cdot 4 = -7 - 12 = -19$$

5.



In the clock above, each hour represents $\frac{1}{12}$ of the clock. So 5:00 would represent $\frac{5}{12}$ of the clock. The clock, a circle, has 360°s, so $\frac{5}{12} \cdot 360° = 150°$.

6. **A.** If you let *n* = the numerator of the fraction, then *n* + 3 = the denominator of the fraction.

The problem says your fraction, which is now $\frac{n}{n+3}$, is equal to $\frac{14}{35}$. You then solve:

$$\frac{n}{n+3} = \frac{14}{35}$$

$35n = 14(n + 3)$ Cross multiply to solve the given proportion.

$35n = 14n + 42$ Distribute the 14 on the right side.

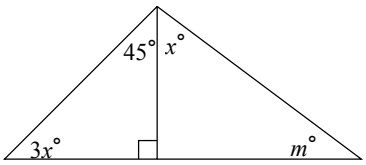
$35n - 14n = 14n + 42 - 14n$ Subtract $14n$ from each side to isolate the variable term.

$21n = 42$

$\frac{21n}{21} = \frac{42}{21}$ =Divide both sides by 21.

$n = 2$

7. **E.**



In the left right triangle in the figure above: $3x + 45 = 90$

$3x + 45 - 45 = 90 - 45$ Subtract 45 from each side.

$3x = 45$

$\frac{3x}{3} = \frac{45}{3}$ =Divide both sides by 3.

$x = 15$

In the right triangle in the right side of the figure above, you know that:

$x + m = 90$

$15 + m = 90$ Substitute $x = 15$ from above.

$15 + m - 15 = 90 - 15$ Subtract 15 from each side.

$m = 75$

8. **D.** Since x is between 0 and 1, use $x = \frac{1}{2}$ and try each choice, I, II, and III.

I. $x > x^{\frac{1}{2}}$ → with $x = 2\frac{1}{2}$, you have $\frac{1}{2} > 2\frac{1}{2}$, which simplifies into $2 > 2\frac{1}{2}$: TRUE

So your answer must include I, thus eliminating Choice **E.**

II. $x^2 < x$ → with $x = \frac{1}{2}$, you have $\left(\frac{1}{2}\right)^2 < 2^{\frac{1}{2}}$, which simplifies into $\frac{1}{4} < \frac{1}{2}$: TRUE

So your answer must now include both I and II. The only viable choice is **D.**You don't even need to try III.

9. **B.** If you let the other number be N, you then have:

$\frac{x + N}{2} = -3m5$ On the left is the average of x and N.

$2\left(\frac{x + N}{2}\right) = 2(3m - 5)$ Multiply both sides by 2. $x + N = 6m - 10$ Distribute the 2 on the right side.

$x + N - x = 6m - 10 - x$ Subtract x from both sides—you are solving for N.

$N = 6m - 10 - x$

10. **A.** Since the graphs of the two equations intersect at the point $(-2, m)$, this point must lie on the graph of EACH of the equations. In particular, when substituted into the first equation, you must get a true statement, so you have:

$y = 2x + 7$ and use the point $(-2, m)$

$m = 2(-2) + 7$ Substitute m for y and -2 for x.

$m = -4 + 7$

$m = 3$ So the point of intersection is now $(-2, 3)$. When substituted into the second equation, you must get a true statement, so you now have:

$y = -3x + r$ and use the point $(-2, 3)$

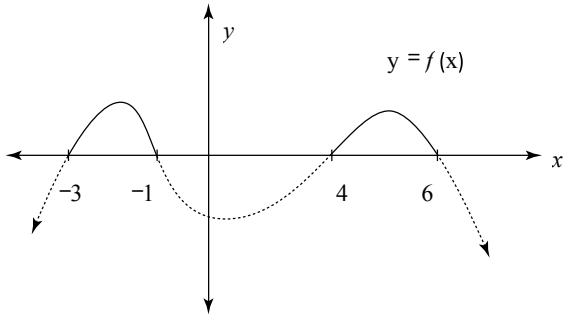
$3 = -3(-2) + r$ Substitute 3 for y and -2 for x.

$3 = 6 + r$

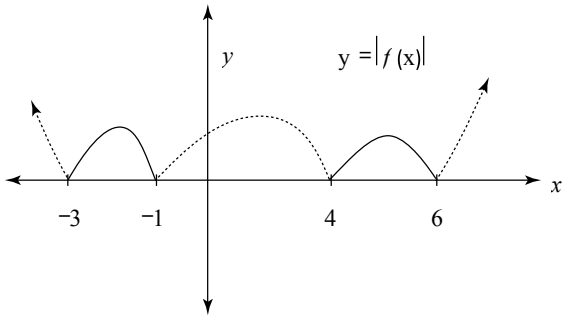
$-3 = r$

11. **B.**

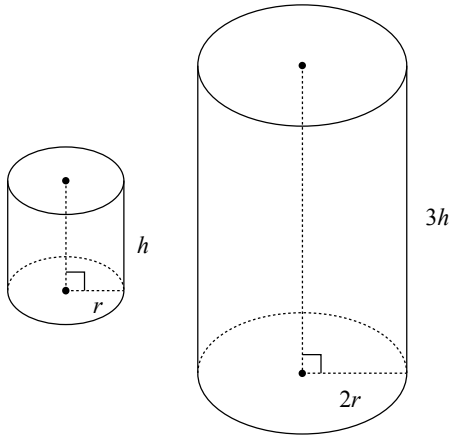
D.



Above is the graph of $y = f(x)$ with portions of the graph below the x-axis dotted, rather than solid. These are the regions in which $f(x)$ is negative. If you took the absolute value of these negative numbers, they would turn into positive numbers instead. So the portions of the graph of $y = f(x)$ that are below the x-axis would end up above the x-axis for the graph of $y = |f(x)|$, as in the figure below. Note that the positive regions of $y = f(x)$ would change their location since their absolute value would still be positive for the graph of $y = |f(x)|$.



12. **A.** With the radius of our cylinder doubled and its height tripled, you end up with the original and new cylinders as shown below.



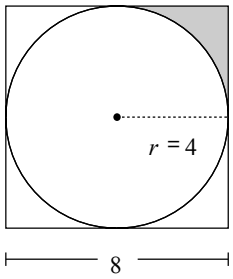
$VOL_{original}$ $\pi r h_{22}$ $= \pi r$ $= \frac{\pi r^2 h}{2} = \frac{1}{}$ h_{22}

=

VOL_{new} π ^ h ^ h2*r* 3*h* π : 4*r* : 3*h*12π *r h* 12

13. **C.** To find the area of the shaded region, you find the difference in areas of the square and circle, and then find $\frac{1}{4}$ of this result.

If the perimeter of the square is 32, the length of one of its sides is just $\frac{32}{4} = 8$. As can be seen in the figure below, the radius of the circle is just $\frac{1}{2}$ of this, so $r = 4$.



Then $AREA_{shaded} = \frac{AREA_{square} - AREA_{circle}}{4}$

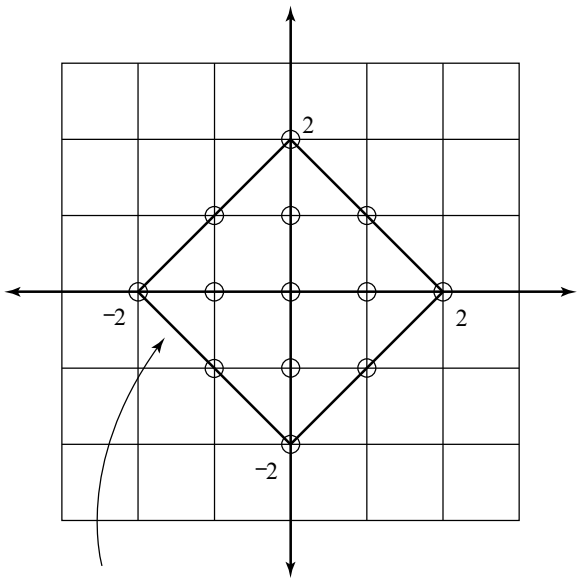
2 2

$= \frac{8 - \pi \cdot 4}{4}$ Area square = (side)^2 and area circle $= \pi r^2$

$$= \frac{64 - 16\pi}{4}$$

$= 16 - 4\pi$ Divide each term in expression above by 4.

14. **E.** In the figure below, the four dark segments forming the diamond represent the graph of the equation $|x| + |y| = 2$.



Graph of $|x| + |y| = 2$
(solid line segments)

The integer pairs *(x, y)* that satisfy the inequality $|x| + |y| \leq 2$ are those on the figure above with an open circle around them—count them all and you count 13 such points.

15. **E.** With x = smallest even integer, then $x + 2$ = medium even integer, and $x + 4$ = largest even integer.

Their sum would be: $x + (x + 2) + (x + 4) = 3x + 6$. So $3x + 6 = 72$ works, as in I.

With $y - 2$ = smallest even integer, then y = medium even integer, and $y + 2$ =

largest even integer.

Their sum would be: $(y - 2) + y + (y + 2) = 3y$. So $3y = 72$, also works, as in II.

With $z - 4$ = smallest even integer, then $z - 2$ = medium even integer, and z =

largest even integer.

Their sum would be: $(z - 4) + (z - 2) + z = 3z - 6$. So $3z - 6 = 72$ also works, as in III.

Therefore I, II, and III work, so the correct answer choice is **E.** $\underline{x}$

$\underline{+ 4}$

16. **A.** If is an integer, that means $x + 4$ must be even, so x is even. 2 y - 3

If ____ is an integer, that means $y - 3$ must be even, so y is odd. 2

Then with x even and y odd, their product xy will be even, as in Choice A.

SAT I Score Range Approximator

The following charts are designed to give you only a very approximate score range, not an exact score. When you take the actual new SAT I, you will see questions similar to those in this book; however, some questions may be slightly easier or more difficult. Needless to say, this may affect your scoring range.

How to Approximate Your Score in Mathematics

1. Add the total number of correct responses for the three Mathematics sections.
2. Add the total number of incorrect responses for the multiple-choice questions only.
3. The total number of incorrect responses for the multiple-choice questions should be divided by 4, giving you an adjustment factor (round off to the nearest whole number).
4. Subtract this adjustment factor from the total number of correct responses to obtain a raw score.
5. This raw score is then scaled to a range from 200 to 800.

   Example:

   If the total number of correct answers is 30 out of a possible 45
   and 16 multiple-choice problems were attempted but missed,
   dividing 16 by 4 gives an adjustment factor of 4.
   Subtracting this adjustment factor of 4 from the original 30 correct gives a raw score of 24.
   This raw score is then scaled to a range from 200 to 800.

   Note: No deduction is made for incorrect grid-in responses.
6. Using your scores:

   _____ – _____ = _____
   total correct answers wrong answers on multiple choice ÷ 4 raw score
7. Use the following table to match your raw score for Mathematics and the corresponding approximate score range:

Raw Score	*Approximate Score Range*
49–55	710–800
41–49	640–700
26–40	500–630
11–25	380–490
5–10	310–370
1–4	240–300
4–0	200–230

Keep in mind that this is only an *approximate* score range.