Name   Date   Class

ACT Practice Test 1 Section 1
Time—60 minutes, 60 Questions

DIRECTIONS: Solve each problem, choose the correct answer, and then fill in the corresponding oval on your answer document.

Do not linger over problems that take too much time. Solve as many as you can; then return to the others in the time you have left for the test.

You are permitted to use a calculator on this test. You may use your calculator for any problems you choose, but some of the problems may best be done without using a calculator.

Notes: Unless otherwise stated, all of the following should be assumed.

1. Illustrative figures are NOT necessarily drawn to scale.
2. Geometric figures lie in a plane.
3. The word *line* indicates a straight line.
4. The word *average* indicates arithmetic mean.

---

1. Ten thousand tires are being stored in a warehouse. Two percent of the tires are not usable. What is the ratio of usable tires to not usable tires?

   A. $\dfrac{1}{98}$

   B. $\dfrac{1}{50}$

   C. $\dfrac{1}{49}$

   D. $\dfrac{49}{1}$

   E. $\dfrac{50}{1}$

DO YOUR FIGURING HERE.
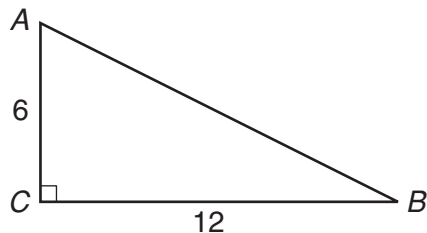
2. What is the perimeter of triangle ABC?

   F. $6\sqrt{2}$

   G. $6\sqrt{5}$

   H. $18 + 6\sqrt{2}$
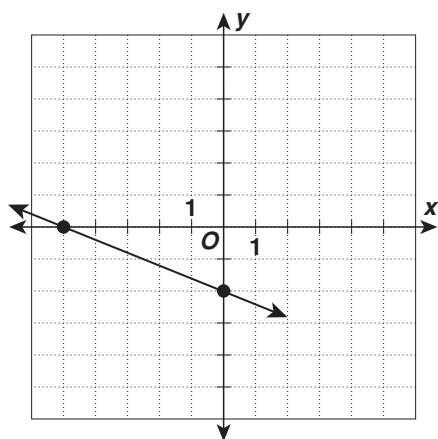
   J. $18 + 6\sqrt{5}$

   K. $24\sqrt{5}$

GO ON

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ACT Practice Test 1 Section 1 *continued*

3. How many real roots does the equation
   $x^2 + 9 = 0$ have?

   A. 0

   B. 1

   C. 2

   D. 3

   E. 9

4. What is the slope of the graphed line?

   F. $-\dfrac{5}{2}$

   G. -2

   H. $-\dfrac{2}{5}$

   J. $\dfrac{2}{5}$

   K. $\dfrac{5}{2}$

5. Every item on the clearance rack at a store
   is marked down 30%. Which of the following
   is a function to represent the price after the
   discount?

   A. $f(x) = 0.3x$

   B. $f(x) = 0.4x$

   C. $f(x) = 0.7x$

   D. $f(x) = 3.0x$

   E. $f(x) = 7.0x$

GO ON

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ACT Practice Test 1 Section 1 *continued*

6. Which of the following is equivalent to
$(b)(b)(b)(b)(b) + (b)(b)(b)(b)(b)(b)$?

DO YOUR FIGURING HERE.

    F. $11b$

    G. 11^b

    H. $b + 11$

    J. $b^5 + b^6$

    K. b^{11}

7. Which of the following is the best
approximation of $\dfrac{\sqrt{145}}{\sqrt{17}}$?

    A. 3

    B. 12

    C. 17

    D. 22

    E. 30

8. A farmer is plowing a rectangular field that
is 400 feet long and 700 feet wide. If the
farmer can plow approximately 500 square
feet per minute, about how long will it take
him to plow the whole field?

    F. 1 hour

    G. 2 hours

    H. 4 hours

    J. 9 hours

    K. 20 hours

9. Simplify $2(6x + 7) - 5(x + 3)$.

    A. $7x - 1$

    B. $7x + 1$

    C. $7x + 19$

    D. $17x - 1$

    E. $17x + 19$

GO ON

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ACT Practice Test 1 Section 1 *continued*

10. There are 30 antique cars in a parade. Six of the cars are red, 14 are black, 5 are blue, and 5 are white. If a circle graph is used to represent this information, what percent of the graph would accurately represent the number of red cars?

F. 5

G. 6

H. 16.7

J. 20

K. 24

DO YOUR FIGURING HERE.

-1 T 0

11. Which of the following values could NOT be the value of T on the number line above?

A. $-\dfrac{3}{5}$

B. $-0.\overline{6}$

C. $-\left(\dfrac{5}{7}\right)^{2}$

D. $-\left|-\dfrac{2}{3}\right|$

E. $\left(-\dfrac{4}{7}\right)^{-1}$

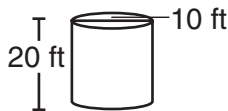**12.** If $4y = 3x - 1$, then $3x =$

F. $4y + 1$

G. $\dfrac{4}{3}y - 1$

H. $\dfrac{4}{3}y + 1$

J. $\dfrac{4y - 1}{3}$

K. $\dfrac{4y + 1}{3}$

GO ON

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13. The measure of the complement of the supplement of angle A is 28°. The measure in degrees of angle A is

   A. 28

   B. 45

   C. 62

   D. 90

   E. 118

DO YOUR FIGURING HERE.

14. What is the image of point $(-1, 4)$ under the translation (x, y) to $(x + 1, y - 2)$?

   F. $(-2, 6)$

   G. $(-2, 2)$

   H. $(-1, 2)$

   J. $(0, 2)$

   K. $(0, 6)$

15. A cylindrical grain bin is being filled. The height of the grain bin is 20 feet and the diameter of its base is 10 feet. After the first 10 minutes, the height of the grain in the bin is 1 foot. At this rate, what will be the volume of the grain in the bin after the first hour?

   A. 150 cubic feet

   B. 100π cubic feet

   C. 150π cubic feet

   D. 600 cubic feet

   E. 600π cubic feet

16. If $a = -2$ and $b = a^2$, then a and b are roots of which equation?

   F. $x^2 + 2x - 8$

   G. $x^2 - 2x - 8$

   H. $x^2 + 2x + 8$

   J. $x^2 - 6x - 8$

   K. $x^2 - 6x + 8$

GO ON

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ACT Practice Test 1 Section 1 *continued*

17. $\frac{3000}{10} + \frac{300}{100} + \frac{30}{1000} + \frac{3}{10000} = ?$
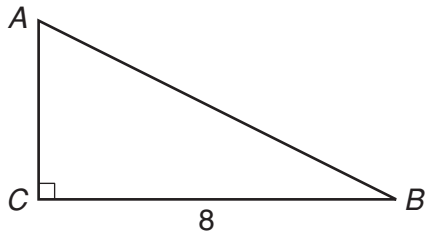
DO YOUR FIGURING HERE.

    A. 300.303

    B. 300.333

    C. 303.0303

    D. 303.33

    E. 333.3

18. What is the center of a circle whose diameter has endpoints (5, 2) and (−1, −4)?

    F. (2, −1)

    G. (2, 0)

    H. (3, −1)

    J. (3, 0)

    K. (1, 1)

19. If $x = \frac{1}{2}$ and $y = -6$, then $xy^2 =$

    A. −18

    B. −12

    C. −6

    D. 6

    E. 18

20. Which statement best describes the relationship between the graphs of $y = 2$ and $x = 2$?

    F. The two lines have the same slope.

    G. The lines are perpendicular.

    H. The lines are parallel.

    J. The lines intersect at (2, 0).

    K. None of the above.

GO ON

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21. A new toy store is giving away 20 model airplanes; 9 are blue, 6 are red, and 5 are black. An airplane is selected at random and given to a customer. If the airplane is red, what is the probability that the next airplane, selected at random, is also red?

DO YOUR FIGURING HERE.

  A. $\frac{5}{20}$

  B. $\frac{6}{20}$

  C. $\frac{5}{19}$

  D. $\frac{6}{19}$

  E. $\frac{14}{20}$

22. What is the length of side AB in $\triangle ABC$ shown above if $\cos B = \frac{2}{3}$?

  F. 6

  G. 8

  H. 9

  J. 10

  K. 12

23. If $f(x) = 2x - 1$ and $g(x) = \sqrt{x + 5}$, what is $f(g(4))$?

  A. 3

  B. $\sqrt{12}$

  C. 5

  D. 15

  E. 17

GO ON

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ACT Practice Test 1 Section 1 *continued*

DO YOUR FIGURING HERE.
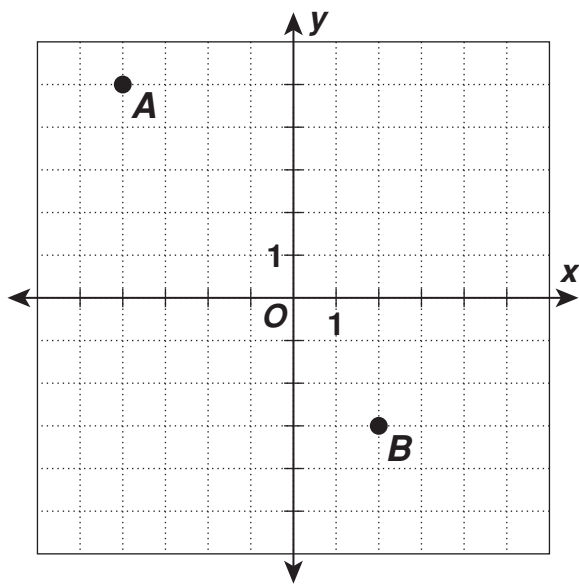
24. The distance between point *A* and point *B* shown in the coordinate grid is

    F. 2

    G. $2\sqrt{6}$

    H. $2\sqrt{10}$

    J. 10

    K. $\sqrt{105}$

25. Which of the following is equal to $3\sqrt{60}$?

    A. $2\sqrt{15}$

    B. $6\sqrt{8}$

    C. $5\sqrt{15}$

    D. $6\sqrt{15}$

    E. $12\sqrt{15}$

26. If $\begin{bmatrix} 2 & 1 \\ -6 & 0 \end{bmatrix} = \begin{bmatrix} 2 & b \\ 2a & 0 \end{bmatrix}$, what is the value of *a*?

    F. -6

    G. -3

    H. -2

    J. 2

    K. 3

GO ON

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ACT Practice Test 1 Section 1 *continued*

27. The speed of light is 3×10^8 meters per second. If the sun is 1.5×10^{11} meters from Earth, and the distance from Pluto to the Sun is approximately 39.5 times the distance of Earth from the Sun, how many seconds does it take light to reach Pluto?

   A. 1.975×10^2

   B. 5.000×10^2

   C. 7.595×10^2

   D. 1.975×10^4

   E. 7.595×10^4

DO YOUR FIGURING HERE.
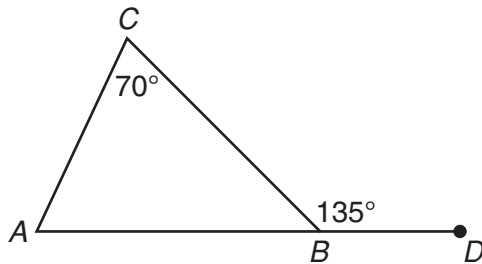
28. The diagram shows triangle *ABC* with segment *AB* extended to point *D*. The measure of angle *CBD* is 135° and the measure of angle *C* is 70°. What is the measure in degrees of angle *CAB*?

   F. 45

   G. 65

   H. 70

   J. 105

   K. 110

29. Each figure in a pattern is a square whose width is one unit less than the width of the previous square. If the first square in the pattern has a perimeter of 40 units, what is the area in square units of the fifth square in the pattern?

   A. 6

   B. 24

   C. 25

   D. 36

   E. 49

GO ON

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ACT Practice Test 1 Section 1 *continued*
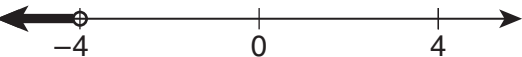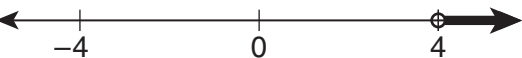
30. Which of the following is equivalent to $(3x^a)^b$?

F. $3x^{ab}$

G. $3x^{a+b}$

H. $3bx^{ab}$

J. $3^b x^{ab}$

K. $3^b x^{a+b}$

31. If $x + 3y = 1$ and $3x + y = 11$, then $3x + 3y = ?$

A. 3

B. 6

C. 9

D. 18

E. 36

32. Which of the following is the graph of the solution set of $-2x - 2 > x + 10$?

F.

G.

H.

J.

K.

33. What is the circumference of a circle whose equation is $(x + 2)^2 + (y - 3)^2 = 36$?

A. 3π

B. 6π

C. 12π

D. 18π

E. 36π

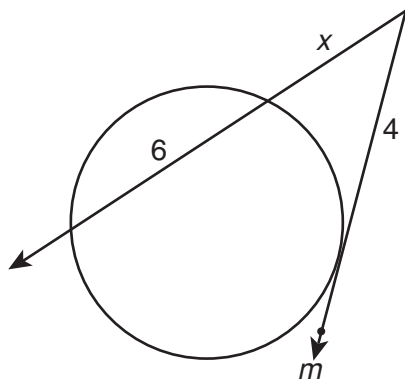**DO YOUR FIGURING HERE.**

GO ON

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ACT Practice Test 1 Section 1 *continued*

34. If *A* is a point in 3D-space with coordinates (5, −1, 6), what is the approximate distance from the origin to point *A*?

    F. 6

    G. 8

    H. 10

    J. 13

    K. 62

35. When the point (−2, 3) is reflected across the *x*-axis, what are the coordinates of its image?

    A. (−2, –3)

    B. (−3, 2)

    C. (−2, 3)

    D. (2, –3)

    E. (3, –2)

36. If *m* and *n* are factors of *p*, and *m* = 6 and *n* = 9, which of the following could NOT be the value of *p*?

    F. 36

    G. 48

    H. 54

    J. 72

    K. 90

37. If *x* = 3, then $\dfrac{2}{\frac{x}{6} + \frac{6}{x}} = ?$

    A. $\dfrac{2}{5}$

    B. $\dfrac{1}{2}$

    C. $\dfrac{4}{5}$

    D. $\dfrac{5}{2}$

    E. 5

DO YOUR FIGURING HERE.

GO ON

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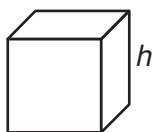
DO YOUR FIGURING HERE.

38. Line *m* is tangent to the circle above. What is the value of *x*?

F. -8

G. -2

H. 2

J. $\frac{8}{3}$

K. 8

39. What is the value of $\sin(2x + \pi)$ if $x = \frac{\pi}{4}$?

A. -1

B. $-\frac{1}{2}$

C. 0

D. $\frac{1}{2}$

E. 1

40. The solid above is a cube and the value of *h* is an integer. Which of the following could NOT be the volume of the cube?

F. 1

G. 3

H. 8

J. 27

K. 64

GO ON

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ACT Practice Test 1 Section 1 *continued*

41. A set of data has 10 values, no two of which are the same. If the smallest data value is removed from the set, which of the following statements MUST be true?

   A. The range of the first data set is greater than the range of the second data set.

   B. The mode of the first data set is greater than the mode of the second data set.

   C. The medians of the two data sets are the same.

   D. The mean of the first data set is greater than the mean of the second data set.

   E. The maximum value of the first data set is greater than the maximum value of the second data set.

42. If x does not equal 0 and $\dfrac{2x^3 - 3x^2}{x^2} < 3$, then x could be any of the following EXCEPT:
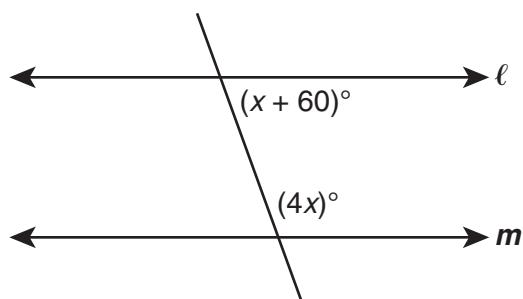
   F. -3

   G. -1

   H. 1

   J. 2

   K. 3

43. A high school baseball team has 4 pitchers, 2 catchers, 3 first basemen, and 1 person for every other position. No person plays more than one position. How many different configurations of players can the coach put on the field?
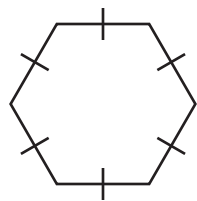
   A. 9

   B. 12

   C. 24

   D. 48

   E. 108

DO YOUR FIGURING HERE.

GO ON

ACT Practice Test 1 Section 1 *continued*

DO YOUR FIGURING HERE.

44. If line ℓ is parallel to line *m* above, what is the value of *x*?

    F. 12

    G. 15

    H. 20

    J. 24

    K. 30

45. The maximum *y*-value of the graph of $y = 6\sin x - 1$ is

    A. -1

    B. 0

    C. 1

    D. 5

    E. 6

46. Which of the following statements is true about the polygon shown above?

    F. The figure is an octagon.

    G. The sum of the figure's interior angles is 540°.

    H. The sum of the figure's exterior angles is 720°.

    J. The measure of each of the figure's interior angles is 120°.

    K. The figure has only one line of symmetry.

GO ON

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ACT Practice Test 1 Section 1 *continued*

47. For the equation $ax^2 + bx + c = 0$,
if $4ac > b^2$, then the equation has

   A. two real roots

   B. two complex roots

   C. one real root and one complex root

   D. no roots

   E. an infinite number of roots

48. The measures of two adjacent angles of
a parallelogram are in the ratio 3 : 5. The
measure in degrees of the smaller angle is

   F. 22.5

   G. 33.5

   H. 67.5

   J. 112.5

   K. 135

49. Points a, b, c, and d all lie on the same line
and $a < b < c < d$. If the distance from a
to b is 3, the distance from a to d is 11, and
the distance from c to d is 2, what is the
distance from b to d?

   A. 3

   B. 4

   C. 5

   D. 6

   E. 8

50. When a furniture store sells a floor model,
it marks the retail price of the model down
30%. Every 30 days after that, the price is
marked down an additional 20% until it is
sold. The store decides to sell a floor model
on March 15th. If the retail price of the item
was $1,200 and the item is sold on June 2nd,
what was the final selling price of the item?

   F. $360.00

   G. $430.08

   H. $537.60

   J. $720.00

   K. $768.00

DO YOUR FIGURING HERE.

GO ON

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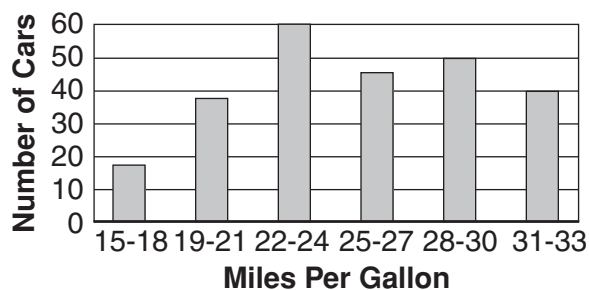
DO YOUR FIGURING HERE.

51. A car rental company monitored its fleet's gas mileage rates. The number of miles per gallon achieved by the company's 250 cars is depicted above. What percent of the cars achieved a gas mileage rating between 22 and 24 miles per gallon?

   A. 24

   B. 30

   C. 42

   D. 46

   E. 60

52. What values of x satisfy the equation $|2x - 1| = |x + 4|$?

   F. None

   G. $x = 5$ only

   H. $x = -\dfrac{5}{3}$ and $x = 5$

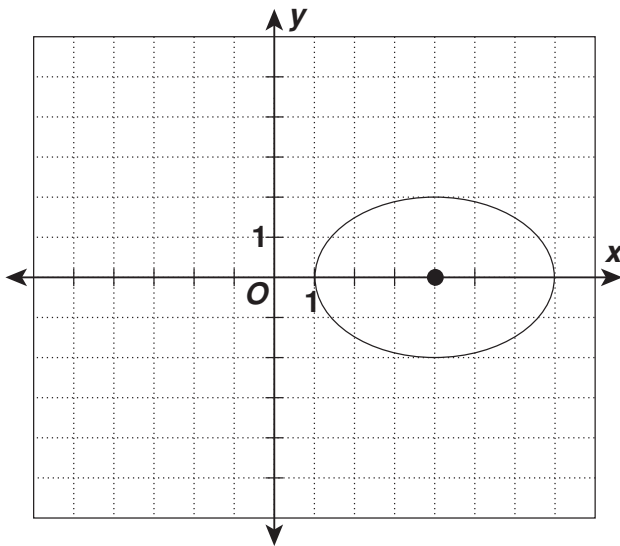   J. $x = -1$ and $x = 5$

   K. $x = \dfrac{5}{3}$ and $x = 5$

53. If $x^2 + 3x - 10 > 0$, then x cannot be which of the following?

   A. -7

   B. -6

   C. -3

   D. 3

   E. 6

GO ON

Holt McDougal College Entrance Exam

ACT Practice Test 1 Section 1 *continued*

DO YOUR FIGURING HERE.

54. Which of the following could be the equation of the conic graphed above?

F. $\dfrac{(x-4)^2}{3} + \dfrac{y^2}{2} = 1$

G. $\dfrac{x^2}{3} + \dfrac{(y-4)^2}{2} = 1$

H. $\dfrac{(x-4)^2}{9} + \dfrac{y^2}{4} = 1$

J. $\dfrac{x^2}{9} + \dfrac{(y-4)^2}{4} = 1$

K. $\dfrac{(x-4)^2}{6} + \dfrac{y^2}{4} = 1$

55. What is the sum of the roots of the equation $(2x - 3)(3x + 1) = 0$?

A. -2

B. $-\dfrac{7}{6}$

C. $\dfrac{7}{6}$

D. $\dfrac{11}{6}$

E. 2

GO ON

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ACT Practice Test 1 Section 1 *continued*

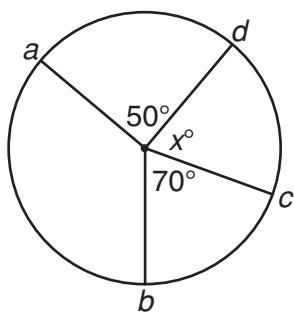| x	-2	-1	1	5
$f(x)$	6	5	3	-1

DO YOUR FIGURING HERE.

56. The table of values given can be derived from which one of the following functions?

F. $f(x) = 2x + 10$

G. $f(x) = x + 2$

H. $f(x) = x^2 + 2$

J. $f(x) = 4 - x$

K. $f(x) = x - 6$

57. Which of the following values of x satisfies the equation $\cos 4x + 1 = 0$, if $\frac{\pi}{2} \le x \le \pi$?

A. $\frac{\pi}{4}$

B. $\frac{\pi}{2}$

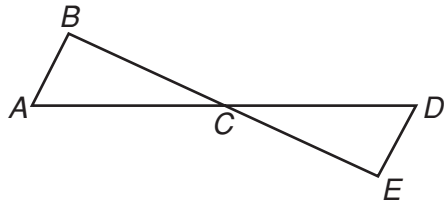C. $\frac{3\pi}{4}$

D. $\frac{5\pi}{6}$

E. $\frac{15\pi}{16}$

58. If the measure of $\overset{\frown}{ab}$ is equal to 2 times the measure of $\overset{\frown}{cd}$, what is the value of x in degrees?

F. 60

G. 80

H. 90

J. 140

K. 240

GO ON

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ACT Practice Test 1 Section 1 *continued*

DO YOUR FIGURING HERE.

GIVEN: Point C is the midpoint of $\overline{AD}$
and $\overline{BE}$.
PROVE: $\triangle ABC \cong \triangle DEC$

Statement	Justification
1. C is the midpoint of $\overline{AD}$ and $\overline{BE}$.	Given
2. $\overline{AC} \cong \overline{DC}$ and $\overline{BC} \cong \overline{EC}$	Definition of midpoint
3. $\angle ACB \cong \angle DCE$	?
4. $\triangle ABC \cong \triangle DEC$	SAS

59. Which property provides justification for
Statement 3 in the proof?

   A. Reflexive Property

   B. Transitive Property

   C. Alternate interior angles are congruent.

   D. Vertical angles are congruent.

   E. Adjacent angles are congruent.

60. Simplify $\dfrac{1}{\dfrac{1}{2x} + \dfrac{x}{2}}$.

   F. $\dfrac{2}{3x}$

   G. $\dfrac{1}{x^2}$

   H. $\dfrac{2x}{1 + x^2}$

   J. $\dfrac{4x}{x + 1}$

   K. $\dfrac{4x}{2 + x^2}$

STOP If you finish before time is called, you may
check your work on this section only.
Do not turn to any other section in the test.

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