

GEOMETRY READINESS TEST

This diagnostic test assesses mathematical preparation for a geometry course.

CALCULATORS ARE NOT RECOMMENDED.

GR – A
2006

A suggested time for this test is approximately 45 minutes.

The diagnostic value of the results may be reduced if students use calculators. Teachers may allow students to use calculators, but graphing calculators and calculators with "Solve" keys should not be used.

INSTRUCTIONS

1. Wait until you are told to start before beginning the test.
2. Work each problem and then on the answer sheet mark the space which corresponds to your answer. The test booklet, the answer sheet, and all scratch paper must be turned in when the test is finished. **DO NOT WRITE IN THIS BOOKLET.**
3. For each problem you are to select the best response from the given choices.
4. For you and your teacher to make the best use of the test results, you should not guess. If you cannot answer a question, leave it blank.
5. If you find certain problems very time consuming, leave them temporarily. Come back to them after you have gone through the entire test if you have time.

GEOMETRY READINESS TEST - 45 QUESTIONS - 45 MINUTES

1. $11x - 8y - x + 5y =$

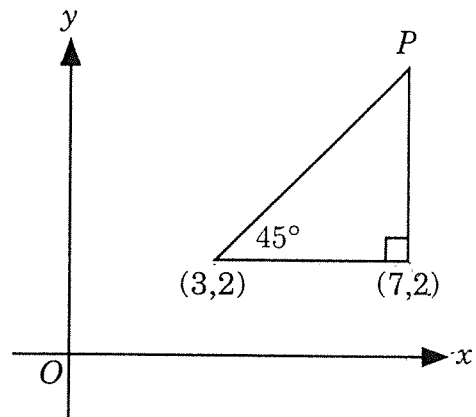
- (A) $11 - 3y$ (B) $10x - 13y$ (C) $10x - 3y$ (D) $12x - 13y$ (E) $12x - 3y$
-

2. $(a^2)^3 =$

- (A) a^5 (B) a^6 (C) a^8 (D) $2a^3$ (E) $8a^3$
-

3. In the figure shown to the right, what are the coordinates of vertex P ?

- (A) (3,6) (B) (3,7) (C) (7,3)
(D) (7,4) (E) (7,6)



4. If $x = 3$ and $y = -2$, then $\frac{7x - 3y}{2x + y} =$

- (A) 23 (B) $\frac{27}{4}$ (C) $\frac{15}{4}$ (D) $\frac{27}{8}$ (E) $\frac{15}{8}$
-

5. If the area of a square is 9, then the perimeter of the square is

- (A) 81 (B) 36 (C) 18 (D) 12 (E) 6
-

6. $(x + 4)(x - 7) =$

- (A) $-28x^2$ (B) $x^2 + 4x - 28$ (C) $x^2 - 11x - 28$
(D) $x^2 - 28$ (E) $x^2 - 3x - 28$
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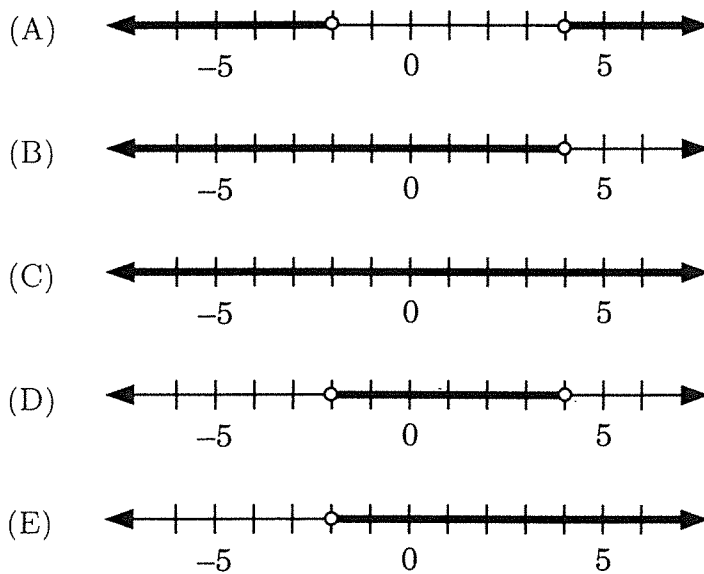
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7. The following statements are assumed to be true.
- I. If the school play was cancelled, then the ticket costs were refunded.
 - II. If it rained Tuesday, then the school play was cancelled.
 - III. It rained Tuesday.

Which of the following conclusions must be true?

- (A) The school play was given Wednesday. (B) The school play was not cancelled.
(C) The ticket costs were refunded. (D) The ticket costs were not refunded.
(E) It rained on Wednesday as well as on Tuesday.
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8. Which of the following graphs represents all values of x such that $x > -2$ and $x < 4$?



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9. $\frac{x^2y^3}{xy^9} =$

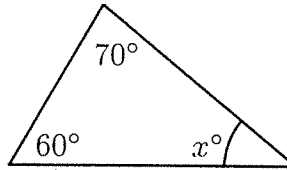
- (A) $\frac{x}{y^6}$ (B) $\frac{x}{y^3}$ (C) $\frac{x^2}{y^6}$ (D) $\frac{x^2}{y^3}$ (E) $\frac{x^3}{y^{12}}$
-

10. If $y = 3x$ and $4x - 2y = 5$, then $x =$

- (A) $-\frac{15}{2}$ (B) $-\frac{5}{2}$ (C) $\frac{11}{6}$ (D) $\frac{5}{2}$ (E) $\frac{15}{2}$
-

11. In the figure shown to the right, $x =$

- (A) 70 (B) 60 (C) 50
(D) 40 (E) 35

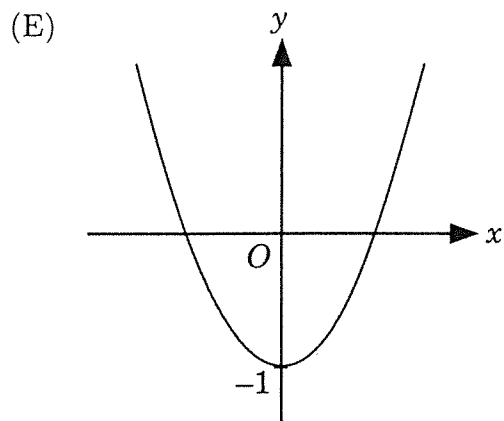
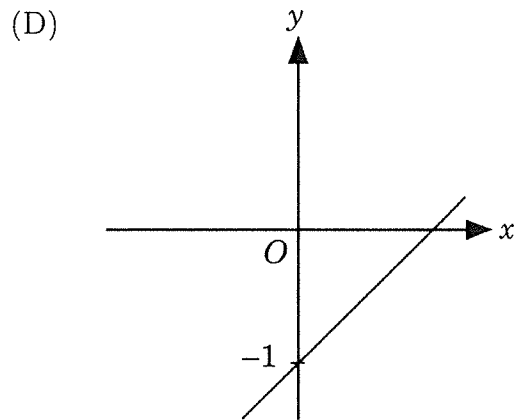
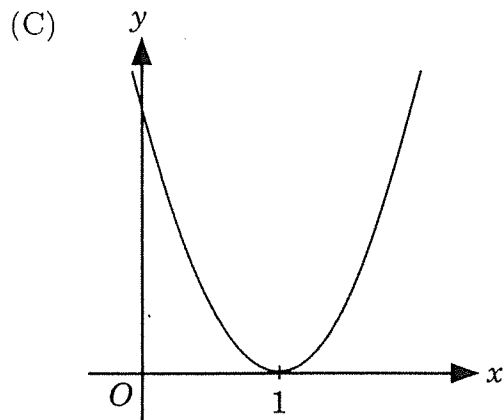
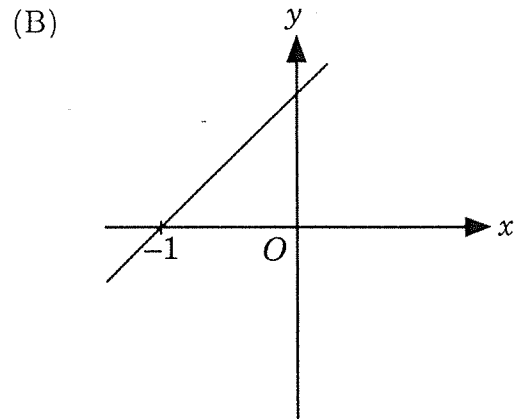
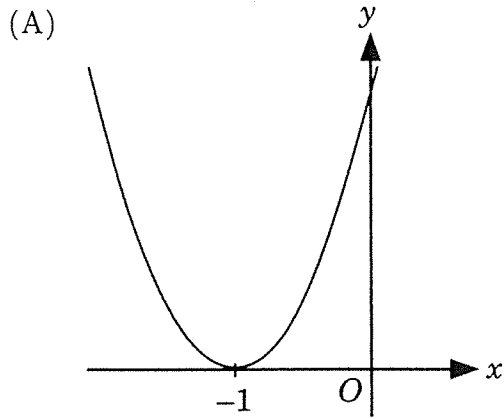


12. If $x - \frac{3}{8}x = 5$, then $x =$

- (A) -10 (B) -1 (C) 1 (D) 8 (E) 43
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13. Which of the following could be a portion of the graph of $y = x^2 - 1$?

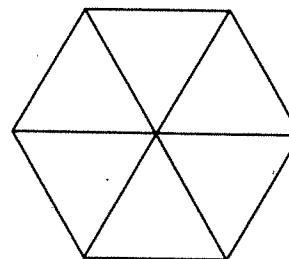


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14. $\sqrt{5} \sqrt{15} =$

- (A) $\frac{75}{2}$ (B) 75 (C) $5\sqrt{3}$ (D) $25\sqrt{3}$ (E) $3\sqrt{5}$
-

15. A regular hexagon is formed from 6 equilateral triangles as shown in the figure to the right. If each triangle has perimeter 12, then the perimeter of the hexagon is



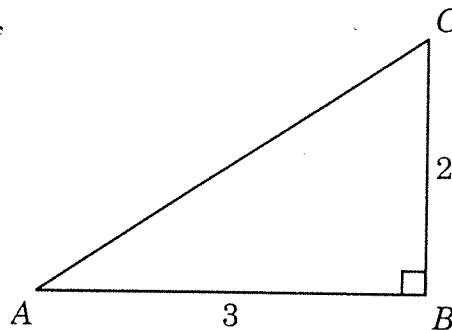
- (A) 18 (B) 24 (C) 36
(D) $24\sqrt{2}$ (E) $24\sqrt{3}$
-

16. Which of the following is a solution to $x^2 + 2x - 3 = 0$?

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

17. In right triangle ABC shown to the right, what is the length of AC ?

- (A) 1 (B) 4 (C) 5
(D) $\sqrt{10}$ (E) $\sqrt{13}$



18. $\frac{9t^2 - 6t}{3t} =$

- (A) $-3t$ (B) $3t + 2$ (C) $3t - 2$ (D) $9t^2 + 2$ (E) $9t^2 - 2$
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19. A length of pipe that weighs 45 pounds is cut into two pieces. One of the pieces is 3 feet long and weighs 18 pounds. In feet, what is the length of the other piece?

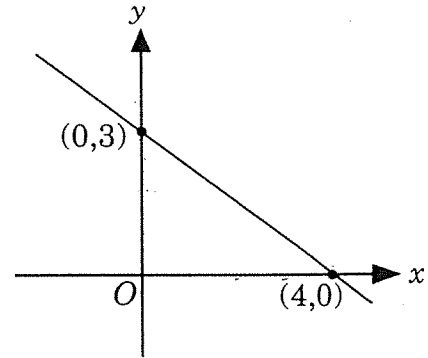
(A) $7\frac{1}{2}$ (B) $4\frac{1}{2}$ (C) 2 (D) $1\frac{1}{5}$ (E) $\frac{2}{9}$

20. Which of the following is an equation of the line shown in the figure to the right?

(A) $y = -\frac{4}{3}x + 3$ (B) $y = -\frac{3}{4}x + 3$

(C) $y = -\frac{3}{4}x + 4$ (D) $y = \frac{4}{3}x + 3$

(E) $y = \frac{4}{3}x + 4$



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21. A box contains 210 marbles which are either red or blue. There are 12 more red marbles than blue marbles. How many red marbles are in the box?

(A) 198 (B) 186 (C) 117 (D) 111 (E) 87

22. If $\begin{cases} x + y = 2 \\ x - y = 6 \end{cases}$, then $y =$

(A) -8 (B) -4 (C) -2 (D) 2 (E) 8

23. $(3x + 2y)^2 =$

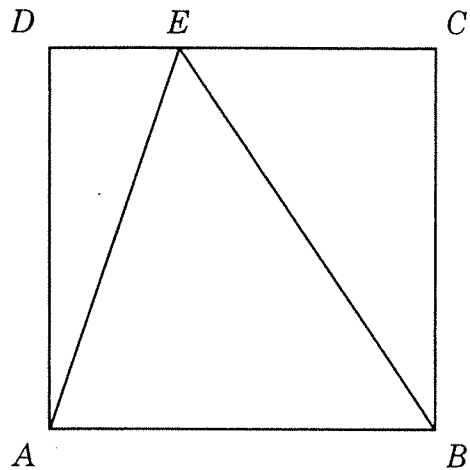
(A) $9x^2 + 4y^2$ (B) $9x^2 + 10xy + 2y^2$ (C) $9x^2 + 12xy + 2y^2$

(D) $9x^2 + 6xy + 4y^2$ (E) $9x^2 + 12xy + 4y^2$

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24. In the square $ABCD$ shown to the right, $AB = 6$ and $DE = 2$. What is the area of triangle ABE ?

- (A) 6 (B) 12 (C) 18
(D) 30 (E) 36



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25. $4x + 5 \leq 2x - 3$ is equivalent to

- (A) $x \leq -4$ (B) $x \leq 1$ (C) $x \leq 4$ (D) $x \geq -4$ (E) $x \geq 4$

-
26. What are all possible values of x such that $x^2 = 2x$?

- (A) 0 only (B) $\sqrt{2}$ only (C) 2 only (D) $-\sqrt{2}$ and $\sqrt{2}$ (E) 0 and 2

27. $\frac{2}{3a} + \frac{5}{a} =$

- (A) $\frac{7}{3a}$ (B) $\frac{17}{3a}$ (C) $\frac{7}{4a}$ (D) $\frac{2a + 15}{3a}$ (E) $\frac{2 + 15a}{3a}$

28. $16x^2 - a^2 =$

- (A) $(4x - a)^2$ (B) $(4x + a)^2$ (C) $(16x - a)^2$
(D) $(4x - a)(x + a)$ (E) $(4x - a)(4x + a)$

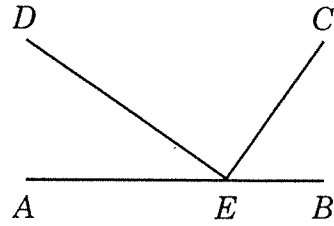
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29. If $\frac{3}{x-1} = 2$, then $x =$

- (A) $\frac{3}{5}$ (B) $\frac{5}{3}$ (C) 2 (D) $\frac{5}{2}$ (E) 3
-

30. In the figure shown to the right, $DE \perp CE$.
If $\angle AED = 35^\circ$, then $\angle CEB =$

- (A) 35° (B) 45° (C) 55°
(D) 65° (E) 145°

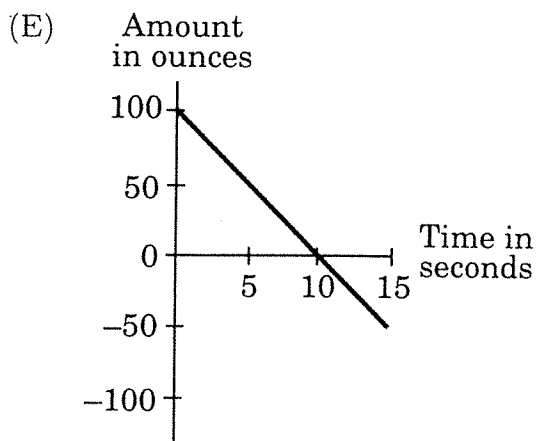
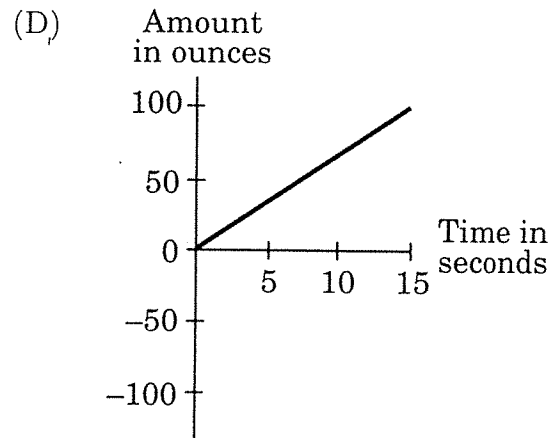
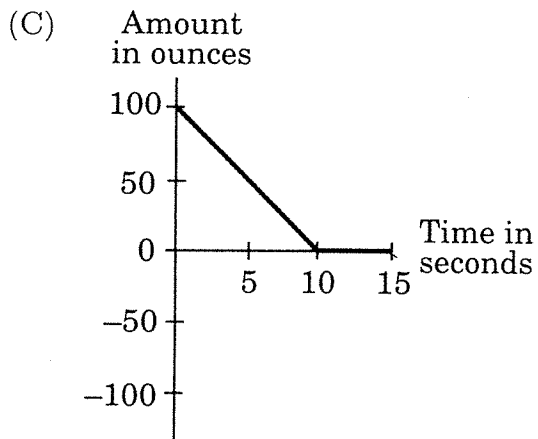
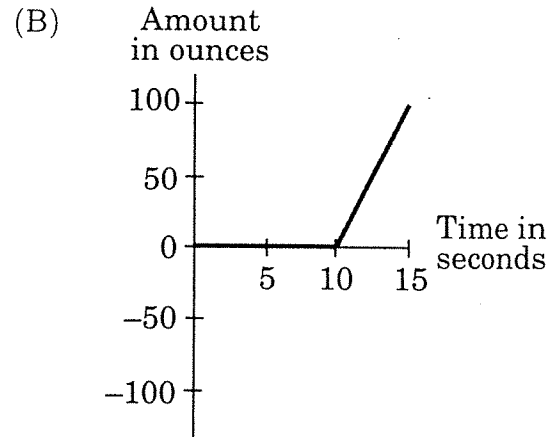
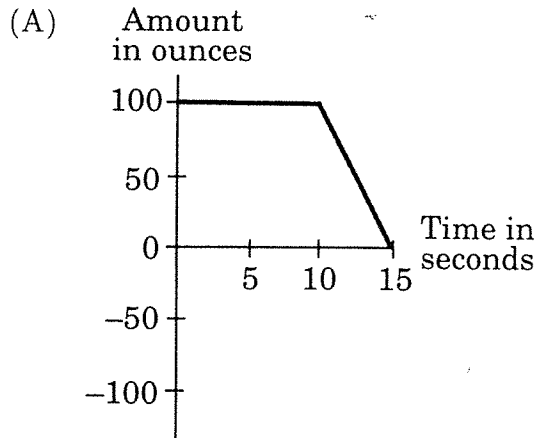


31. $\frac{a}{a-b} \div \frac{a}{b} =$

- (A) $\frac{1}{a-1}$ (B) $\frac{b}{a-b}$ (C) $\frac{b}{a(1-b)}$ (D) $\frac{a}{b(1-b)}$ (E) $\frac{a^2}{b(a-b)}$
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32. A jar contains 100 ounces of lemonade. A spout at the bottom of the jar is opened and the lemonade pours out at a rate of 10 ounces per second. Which graph below represents the amount of lemonade in the jar for the first 15 seconds after the spout was opened?



33. The length of a side of a cube is $4x$ units. In cubic units, what is the volume of the cube?

- (A) $64x^3$ (B) $12x^3$ (C) $96x^2$ (D) $64x^2$ (E) $16x^2$
-

34. $10x^2y^3 + 15x^2y^2 - 5xy =$

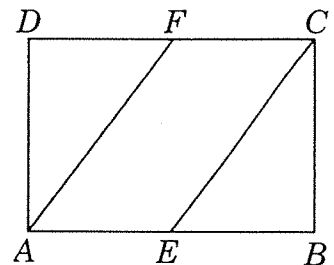
- (A) $20x^2y^3$ (B) $20x^5y^6$ (C) $5xy(2xy^2 + 3xy)$
(D) $5xy(2xy^2 + 3xy + 1)$ (E) $5xy(2xy^2 + 3xy - 1)$
-

35. A line has a slope of -2 and passes through the point $(-4, 3)$. What is an equation of the line?

- (A) $y = -2x - 5$ (B) $y = -2x - 2$ (C) $y = -2x + 2$
(D) $y = -2x + 3$ (E) $y = -2x + 5$
-

36. In rectangle $ABCD$ shown to the right, $AD = 4$, $AB = 6$. E is the midpoint of AB , and F is the midpoint of DC . In square units, what is the area of parallelogram $AECF$?

- (A) 24 (B) 18 (C) 15
(D) 12 (E) 6



37. $\sqrt{a}(5 - 3\sqrt{a}) =$

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

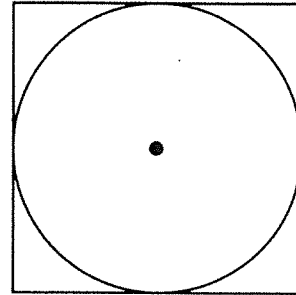
38. The volume of a rectangular box is 72. The base of the box is a square with sides of length 3. What is the height of the box?

- (A) 6 (B) 8 (C) 9 (D) 12 (E) 24
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39. A circle is inscribed in a square as shown in the figure to the right. The length of a side of the square is 10. What is the area of the circle?

- (A) 25 (B) 100 (C) 10π
(D) 25π (E) 100π

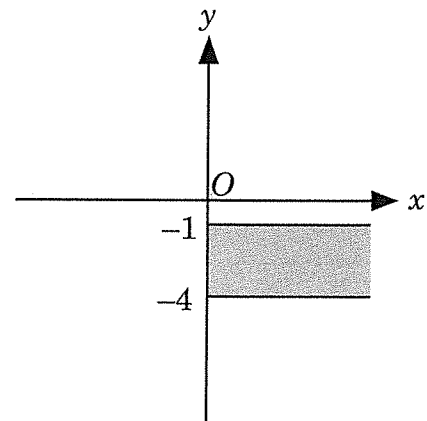


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40. One of the solutions of the equation $x^2 - x = 12$ is

- (A) -12 (B) -4 (C) -3 (D) 3 (E) 12

-
41. Which of the following pairs of inequalities best describes the shaded region shown in the figure to the right?

- (A) $-4 \leq x \leq -1$ and $y \geq 0$
(B) $-4 \leq x \leq -1$ and $y \leq 0$
(C) $x \geq 0$ and $1 \leq y \leq 4$
(D) $x \geq 0$ and $-1 \leq y \leq -4$
(E) $x \geq 0$ and $-4 \leq y \leq -1$

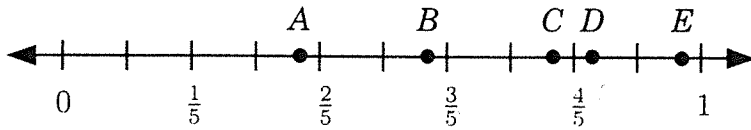


42. $\frac{w^2 + 6w + 5}{w + 5} =$

- (A) $w + 1$ (B) $w + 6$ (C) $7w + 1$ (D) $w^2 + 6$ (E) $\frac{w^2 + 7}{2}$

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43.



On the number line shown above, which letter best locates the number $\frac{4}{7}$?

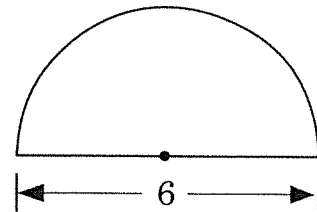
- (A) A (B) B (C) C (D) D (E) E

44. $\sqrt{50} - \sqrt{18} =$

- (A) 2 (B) 4 (C) 16 (D) $2\sqrt{2}$ (E) $4\sqrt{2}$

45. What is the perimeter of the semicircular figure shown to the right?

- (A) $12\pi + 6$ (B) $6\pi + 3$ (C) $6\pi + 6$
 (D) $3\pi + 3$ (E) $3\pi + 6$



END OF EXAMINATION