TEST TWO

41. **(C)** We may find the least common denominator by writing the multiples of the denominators, as follows:

For $\frac{1}{3}$: 3, 6, 9, 12, 15, 18, 21, (24)

For $\frac{3}{8}$: 8, 16, (24)

For $\frac{5}{6}$: 6, 12, 18, (24)

The first number that appears in all three multiples of the denominators is the least common denominator. In this case, the least common denominator is 24.

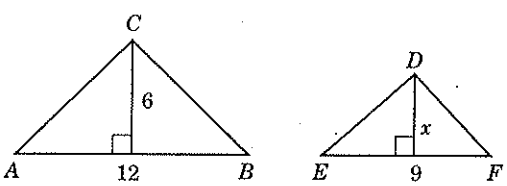
42. **(A)** $5 < x < 9$ means that $x > 5$ and $x < 9$, or x is 6, 7, or 8.

$3 < x < 7$ means that $x > 3$ and $x < 7$ or x is 4, 5, or 6.

To satisfy both inequalities, x must be 6. Note that, as the choices indicate, x is an integer.

43. **(D)** Area of $\triangle ABC = \frac{1}{2}(12)(6) = 36$ square inches

Area of $\triangle DEF = \frac{1}{2}(9)x = \frac{9}{2}x$



Since the areas are equal, we have

$\frac{9}{2}x = 36$

$9x = 72$

$x = 8$

44. **(C)** By definition a centimeter is equal to one hundredth ($\frac{1}{100}$) of a meter.

45. **(B)** $(4 \times 10^3) + 5(10^2) + 7 = 4507$

$(6 \times 10^3) + (7 \times 10^2) + (2 \times 10) + 4 = 6724$

$6724 - 4507 = 2217$

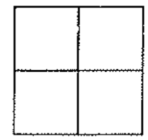
46. **(C)** $(3 \square 6)(4) = 432$

$72 \square = 432$

$\square = \frac{432}{72} = 6$

47. **(C)** Written as a decimal, $\frac{3}{5} = 0.60$ and $0.60 = 60\%$

48. **(C)** See the diagram. If we call the original square S and we double each side, we obtain an enlarged square having an area exactly 4 times the area of S.



ALTERNATE METHOD

Let each side of $S = 5$ inches.

Then the area of $S = 25$ square inches.

When we double each side of S, the original square, we have 10 inches on a side. Then the area of the new square $= 10 \times 10 = 100$ square inches. To go from 25 square inches to 100 square inches is to multiply by 4.

49. **(B)** Let x = cost of jacket

Then $0.06x = 4.50$

$$x = \frac{4.50}{0.06} = \frac{450}{6} = 75$$

50. **(B)** Let x = the number

Then $\frac{x}{7} = 19 + \frac{3}{7}$

After we multiply both sides of the equation by 7, we have

$x = 7(19) + 3$

$x = 133 + 3 = 136$

51. **(B)** $6 \times 7 \times 8 \times \square = 48 \times 63$

Since $6 \times 8 = 48$, we have

$48 \times 7 \times \square = 48 \times 63$

or $7 \times \square = 63$

$\square = \frac{63}{7}$

52. **(C)** $x + 6 = y + 4$

If we subtract 6 from both sides of the equation, we have $x = y - 2$. This means that x is 2 less than y, or $y > x$.

53. **(D)** 7% means 7 hundredths, which can be written as 0.07.

54. **(B)** After $\frac{2}{3}$ of the sets were sold the first day, $\frac{1}{3}$ of the sets were left.

$\frac{1}{2}$ of the remainder = $\frac{1}{2} \times \frac{1}{3} = \frac{1}{6}$

Thus, $(\frac{2}{3} + \frac{1}{6})$ of the sets were sold the first 2 days:

$\frac{2}{3} + \frac{1}{6} = \frac{4}{6} + \frac{1}{6} = \frac{5}{6}$, leaving $\frac{1}{6}$ unsold

Let x = number of sets put on sale the first day

$\frac{1}{6}x = 15$

$x = 90$

55. **(B)** The area of the rectangular part of the doorway = 12 × 9 = 108. The radius of the circular part of the doorway is 6. The area of this circle is 36π, and the area of the semicircle is 18π. The total area of the doorway is $108 + 18\pi$.

56. **(D)** $5 > x > 3$ means that x is greater than 3 but less than 5. Since x is a positive integer, $x = 4$.

$x^2 = 4 \times 4 = 16$

57. **(B)** The sum of the measures of the angles of a triangle is 180°. If one angle is a right angle, the sum of the measures of the other two angles is 90°. In an isosceles right triangle the sum of the measures of the acute angles is 90°, and the measures of the acute angles are equal. Thus, the measure of each acute angle is 45°.

58. **(C)** 5000 in expanded form = (5×10^3)
600 in expanded form = (6×10^2)
10 in expanded form = (1×10)
5618 in expanded form = $(5 \times 10^3) + (6 \times 10^2) + (1 \times 10) + 8$

59. **(A)** $\frac{5}{\frac{3}{7}} = 5 \div \frac{3}{7} = 5 \times \frac{7}{3} = \frac{35}{3}$

60. **(B)** The $\cap$ symbol means "intersection."

$\overline{RT} = \overline{RS} + \overline{ST}$, $\overline{SV} = \overline{ST} + \overline{TV}$

The intersection of $\overline{RT}$ and $\overline{SV}$ is $\overline{ST}$.

61. **(A)** For Column A, $\frac{1}{4} + \frac{5}{6} = \frac{3}{12} + \frac{10}{12} = \frac{13}{12}$

For Column B, $1\frac{3}{8} - \frac{1}{2} = \frac{11}{8} - \frac{4}{8} = \frac{7}{8}$

The quantity in Column A is greater than the quantity in Column B.

62. **(B)** Since m $\angle C = 90°$ and m $\angle B = 42°$, m $\angle A = 180° - (90 + 42) = 48°$. Therefore, $AC < CB$ since the smaller side of the triangle lies opposite the smaller angle. The quantity in Column B is greater than the quantity in Column A.

63. **(C)** Area of rectangle = 15 × 12 = 180

Area of triangle = $\frac{20 \times 18}{2} = 180$

The quantity in Column A is equal to the quantity in Column B.

64. **(D)** x is an integer and y is an integer, with $x > y$.

If $x = 5$, $\frac{1}{x} = 5$. If $y = 2$, $\frac{1}{y} = \frac{1}{2}$.

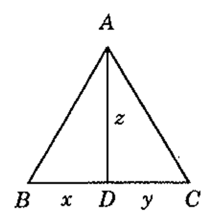
In this case, $\frac{1}{y} > \frac{1}{x}$.

If $x = -5$, $\frac{1}{x} = 5$. If $y = -2$, $\frac{1}{y} = \frac{1}{2}$.

In this case, $\frac{1}{x} > \frac{1}{y}$.

Since x and y are integers which may have any value, we cannot decide whether $\frac{1}{x} > \frac{1}{y}$ or $\frac{1}{x} < \frac{1}{y}$. The relationship depends upon the values taken for x and y and cannot be determined from the information given.

65. **(B)** m $\angle BAC = 180° - (55° + 45°) = 80°$
m $\angle BAD = \frac{1}{2}(80) = 40°$

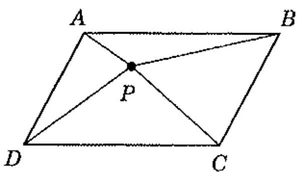


In $\triangle ABD$, $z > x$ because, in a triangle, the greater side lies opposite the greater angle. In $\triangle ADC$, $z > y$ because, in a triangle, the greater side lies opposite the greater angle. Therefore, $2z > x + y$. The quantity in Column B is greater than the quantity in Column A.

66. **(C)** $\triangle ADC = \triangle ABC$ (in area) since a diagonal of a parallelogram divides the parallelogram into two triangles that have equal areas.

The altitude of $\triangle ADC$ = the altitude of $\triangle ABC$ because those triangles are equal in area and have the same base.

The altitude of $\triangle ADP$ = the altitude of $\triangle APB$ and those triangles have the same base ($\overline{AP}$).



Thus, $\triangle APB$ = $\triangle APD$ in area. The quantity in Column A is equal to the quantity in Column B.

67. (**C**) $a = 3, \quad b = -1$
For Column A, $7 - a(b + 5) = 7 - 3(-1 + 5) = 7 - 3(4) = 7 - 12 = -5$
For Column B, $b^2 - 2a = (-1)2 - 2(3) = 1 - 6 = -5$
The quantity in Column A is equal to the quantity in Column B.

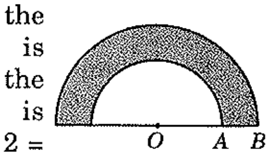
68. (**A**) Let $a = 10$ and $b = 3$.
Then $\frac{a}{b} = \frac{10}{3}$, and $\frac{b}{a} = \frac{3}{10}$.
In general, if $a > b$, then $\frac{a}{b} > 1$ and $\frac{b}{a} < 1$
Thus, $\frac{a}{b}$ (Column A) will always be greater than $\frac{b}{a}$ (Column B).
The quantity in Column A is greater than the quantity in Column B.

69. (**A**) Let $4x$ = Arthur's money
And $3x$ = Ben's money
$4x - 5$ = Arthur's money after Arthur gives Ben \$5
$3x + 5$ = Ben's money after Arthur gives Ben \$5
$4x - 5 = 3x + 5$
$4x - 3x = 5 + 5$
$x = 10$
Arthur's money before giving Ben \$5 = $4x$ = \$40, which is greater than \$25 (Column B). The quantity in Column A is greater than the quantity in Column B.

70. (**A**) $2x + y = 11$
$2x - y = 5$
If we add, we have
$4x = 16$
$x = 4$
Since $2x + y = 11$,
$2(4) + y = 11$
$8 + y = 11$
$y = 11 - 8 = 3$
The quantity in Column A is greater than the quantity in Column B.

71. (**B**) For Column A, $\frac{7}{8} - \frac{1}{4} = \frac{7}{8} - \frac{2}{8} = \frac{5}{8}$
$\frac{5}{8} \div \frac{5}{6} = \frac{5}{8} \times \frac{6}{5} = \frac{3}{4}$
For Column B, $\frac{1}{6} + \frac{5}{12} = \frac{2}{12} + \frac{5}{12} = \frac{7}{12}$
$\frac{7}{12} \div \frac{1}{9} = \frac{7}{12} \times \frac{9}{1} = \frac{63}{12} = \frac{21}{4}$
The quantity in Column B $\left(\frac{21}{4}\right)$ is greater than the quantity in Column A $\left(\frac{3}{4}\right)$.

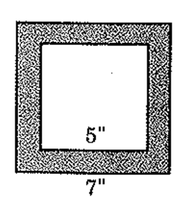
72. (**A**) The radius of the larger semicircle is 10. The area of the larger semicircle is $10 \times 10\pi = 100\pi \div 2 = 50\pi$. The radius of the smaller semicircle is 6. The area of the smaller semicircle is $6 \times 6\pi = 36\pi \div 2 = 18\pi$. The area of the shaded portion is $50\pi - 18\pi = 32\pi$. The quantity in Column A (32π, the area of the shaded portion) is greater than the quantity in Column B (18π, the area of the smaller semicircle).



73. (**D**) $a > b > c$
Let $a = 50, \quad b = 2, \quad c = 1$
Then $b^2 = 4$, $ac = 50 \times 1 = 50$
Let $a = 10$, $b = 8$, $c = 2$
Then $b^2 = 64, \quad ac = 10 \times 2 = 20$
In the first case, $b^2 < ac$. In the second case, $b^2 > ac$. Thus, we cannot tell whether $b^2 > ac$ or $b^2 < ac$. The relationship cannot be determined from the information given.

74. (**C**) $x = \frac{1}{3}, \quad y = \frac{1}{5}$
$\frac{1}{x} = 3, \quad \frac{1}{y} = 5$
For Column A, $\frac{1}{x} + \frac{1}{y} = 3 + 5 = 8$
For Column B, $x + y = \frac{1}{3} + \frac{1}{5} = \frac{5}{15} + \frac{3}{15} = \frac{8}{15}$
$xy = \frac{1}{3} \times \frac{1}{5} = \frac{1}{15}$
$\frac{x+y}{xy} = \frac{\frac{8}{15}}{\frac{1}{15}} = 8$
Thus, $\frac{1}{x} + \frac{1}{y} = 8$ and $\frac{x+y}{xy} = 8$. The quantity in Column A is equal to the quantity in Column B.

75. (**A**) Area of inner square $= 5 \times 5 = 25$ square inches. Area of outer square $7 \times 7 = 49$ square inches. Area of shaded portion $= 49 - 25 = 24$ square inches.
Since $25 > 24$, the quantity in Column A is greater than the quantity in Column B.



76. **(A)** $3x - 1 = 15, \quad 2y + 5 = 12$

For Column A, $3x = 15 + 1 = 16$

$$x = \frac{16}{3} = 5\frac{1}{3}$$

For Column B, $2y = 12 - 5 = 7$

$$y = \frac{7}{2} = 3\frac{1}{2}$$

Thus, $x > y$. The quantity in Column A is greater than the quantity in Column B.

77. **(B)** $\frac{x}{5} = 2 + \frac{4}{5}, \quad \frac{y}{7} = 6 + \frac{3}{7}$

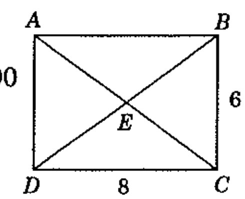
For Column A, if we multiply both sides of the equation by 5, we have
$x = 5(2) + 4$
$x = 10 + 4 = 14$

For Column B, if we multiply by both sides of the equation by 7, we have
$y = 6(7) + 3$
$y = 42 + 3 = 45$

Thus $y > x$. The quantity in Column B is greater than the quantity in Column A.

78. **(C)** Triangle *BCD* is a right triangle. Therefore,

$(BD)^2 = 6^2 + 8^2$
$(BD)^2 = 36 + 64 = 100$
$BD = 10$
$DE = \frac{1}{2}(BD)$
$DE = \frac{1}{2}(10) = 5$



The quantity in Column A is equal to the quantity in Column B.

79. **(A)** $x = 5, \quad y = -3$

$x^2 = 25, \quad y^2 = 9$

For Column A, $x^2 + y^2 = 25 + 9 = 34$

For Column B, $(x + y)^2 = [5 + (-3)]^2 = (2)^2 = 4$

Thus, $x^2 + y^2 > (x + y)^2$, The quantity in Column A is greater than the quantity in Column B.

80. **(C)** Total mileage = 180 + 180 = 360 miles. Total traveling time = 5 + 4 = 9 hours

Average speed = $\frac{360}{9}$ = 40 miles per hour

The quantity in Column A is equal to the quantity in Column B.