

Problem-Attic TSIA 2.0 Samples #1

1. What is the correct way to express $2\frac{1}{20}$ as a decimal?

- a) 0.000205 b) 0.00205 c) 0.0205 d) 0.205 *e) 2.05

2. Which list is in ascending order (least to greatest)?

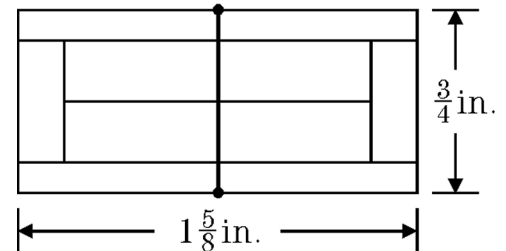
- a) 33%, $\frac{1}{3}$, 0.3, 3.3 b) 3.3, $\frac{1}{3}$, 33%, 0.3 c) $\frac{1}{3}$, 0.3, 33%, 3.3
d) $\frac{1}{3}$, 33%, 0.3, 3.3 *e) 0.3, 33%, $\frac{1}{3}$, 3.3

3. Laurent needs M hours to mow a lawn. He works for X hours before taking a break. Which of the following represents the portion of the mowing job he needs to complete?

- *a) $\frac{M-X}{M}$ b) $\frac{M-X}{X}$ c) $M-X$ d) $X-M$ e) $\frac{X}{M}$

4. The figure is a scale drawing of a tennis court. The scale is $\frac{1}{4}$ inch to 6 feet. What are the dimensions of the actual tennis court?

- a) 16 ft by 37 ft *b) 18 ft by 39 ft
c) 20 ft by 41 ft d) 22 ft by 43 ft
e) 24 ft by 45 ft



5. If $y = 5$, then $7 + 6y =$

- a) 18 b) 23 c) 31 *d) 37 e) 65

6. Simplify: $(-2x^4)^3(-3x^2)^2$

- a) $18x^{16}$ b) $-72x^{11}$ *c) $-72x^{16}$ d) $18x^{11}$ e) $72x^{16}$

7. Which of the following fractions is *not* equal to $\frac{3}{8}$?

- a) $\frac{6}{16}$ b) $\frac{9}{24}$ *c) $\frac{8}{30}$ d) $\frac{15}{40}$ e) $\frac{30}{80}$

8. Which of the following inequalities is true?

a) $\frac{5}{7} < \frac{4}{7}$

*b) $\frac{5}{8} > \frac{6}{11}$

c) $\frac{3}{5} > \frac{8}{11}$

d) $\frac{2}{7} > \frac{2}{5}$

e) $\frac{4}{9} < \frac{3}{8}$

9. Jackson earned \$55.00 walking dogs this week. That amount is 110% of what he earned the previous week. How much did he earn the previous week?

*a) \$50.00

b) \$55.50

c) \$60.50

d) \$5.50

e) \$5.00

10. When Elner filled his car with gas, he recorded the number of gallons purchased and the number of miles driven since the last fill-up.

Number of Gallons	10.1	13.5	16.4
Number of Miles	183	241	295

Based on the table, what is the best estimate for the amount of gas Elner would need to drive 400 miles?

a) 18 gallons

*b) 22 gallons

c) 27 gallons

d) 40 gallons

e) 44 gallons

11. Myesha can set all of the tables in a banquet hall in 1 hour. It takes a new employee $1\frac{1}{2}$ hours to do the same job. If they work together, how long should the job take?

*a) $\frac{3}{5}$ hour

b) $\frac{3}{4}$ hour

c) $\frac{5}{6}$ hour

d) $1\frac{1}{4}$ hours

e) $1\frac{1}{6}$ hours

12. Arjun bought 6 pairs of socks for \$17.40. On average, how much did he pay for each pair?

a) \$1.05

b) \$1.45

c) \$2.10

d) \$2.65

*e) \$2.90

13. Kira is training for a marathon. On consecutive days, she runs the following distances in miles: $2n$, $0.5n$, 9, $2.5n$ and 16. Her average running distance per day is

*a) $n + 5$

b) $5n + 25$

c) $n + 25$

d) $0.2n + 5$

e) $0.5n + 2$

14. The lines $5x + 2y = 9$ and $4kx - 3y = 11$ are parallel. What is the value of k ?

a) $-\frac{10}{3}$

*b) $-\frac{15}{8}$

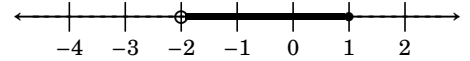
c) $-\frac{8}{15}$

d) $\frac{3}{10}$

e) $\frac{10}{3}$

15. Which inequality is represented by the graph?

- a) $-2 < x \leq -1$ b) $-2 \leq x \leq 1$ c) $-2 \leq x < 1$
 d) $-2 < x < 1$ *e) $-2 < x \leq 1$



16. Evaluate: $(2^{-1} + 5^{-1})^{-1}$

- a) $-\frac{1}{7}$ b) $\frac{1}{7}$ c) $\frac{7}{10}$ *d) $\frac{10}{7}$ e) 7

17. Solve: $\frac{3}{4} + 3y = 15\frac{3}{4}$

- a) $y = 45$ b) $y = 16\frac{1}{2}$ c) $y = 15$ d) $y = 5\frac{1}{2}$ *e) $y = 5$

18. The line joining $(3x, x + 1)$ and $(5, -2)$ has a slope of 4. What is x ?

- a) -22 b) $-\frac{17}{13}$ c) $-\frac{1}{22}$ d) $\frac{11}{23}$ *e) $\frac{23}{11}$

19. For which of the systems is $(-2, 1)$ a solution?

- *a) $\begin{cases} 2x + 2y = -2 \\ -x + y = 3 \end{cases}$ b) $\begin{cases} x - y = 1 \\ 3x - y = -7 \end{cases}$ c) $\begin{cases} -x - 2y = 0 \\ 4x - y = -7 \end{cases}$
 d) $\begin{cases} x + 5y = -3 \\ x - 5y = -5 \end{cases}$ e) $\begin{cases} 10x - y = -21 \\ 20x - y = -39 \end{cases}$

20. An acting class of 27 students has 17 girls. Which expression could be used to determine the percent of boys in the class?

- a) $\frac{17}{27} \cdot 100$ *b) $\frac{27 - 17}{27} \cdot 100$ c) $\frac{27 - 17}{17} \cdot 100$
 d) $\frac{27 + 17}{27} \cdot 100$ e) $\frac{27}{17} \cdot 100$

21. $f(x) = (x + 5)(5 - x)$. What is the value of $f(0)$?

- a) -25 *b) 25 c) 0 d) $x - 5$ e) $x^2 - 25$

22. Point T is 5 units from the origin on the positive x -axis. Which of the following equations represents a line that passes through T ?

- *a) $y = -x + 5$ b) $y = -5$ c) $y = \frac{1}{5}x - 1$ d) $y = 5x$

23. When an object is falling, there may be enough air resistance to balance the force of gravity. When this happens, the object reaches a maximum speed called “terminal velocity”. It can be calculated with this formula:

$$V = \sqrt{\frac{2 \cdot W}{D \cdot r \cdot A}}$$

If the formula is solved for W , the weight of the falling object, then $W =$

- a) $V \left(\frac{\sqrt{2}}{D \cdot r \cdot A} \right)$ b) $V \left(\frac{2}{D \cdot r \cdot A} \right)^2$ *c) $V^2 \left(\frac{D \cdot r \cdot A}{2} \right)$ d) $V^2 \left(\frac{2}{D \cdot r \cdot A} \right)$

24. $5x - 10x^2 = -5x(x - 1)$ is true for

- a) no real value of x b) positive real values of x only
c) negative real values of x only *d) all real values of x

25. Most computer monitors are rectangular and are put on a stand with the longer side parallel to the desktop. Some people like to make the longer side *perpendicular* to the desktop, so it is easier to view a single page of a document. Changing the monitor this way is an example of which type of transformation?

- a) translation b) reflection *c) rotation
d) dilation e) shear



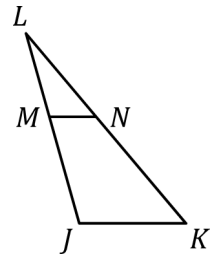
26. Four nails are hammered into a board, then 14 feet of string is pulled tightly around the nails forming a rectangle. If one side of the rectangle is $2\frac{1}{2}$ feet, what is the length of the adjacent side?

- *a) $4\frac{1}{2}$ ft b) $3\frac{1}{2}$ ft c) $2\frac{1}{2}$ ft d) 5 ft e) 7 ft

27. In the figure $\overline{JK} \parallel \overline{MN}$. Complete the proportion:

$$\frac{?}{\overline{LK}} = \frac{\overline{LM}}{\overline{LJ}}$$

- *a) $\overline{LN}$ b) $\overline{MJ}$ c) $\overline{LK}$ d) $\overline{JK}$ e) $\overline{LJ}$



28. How many *milliliters* of liquid are in a 1.75-liter container which is filled to the top?

- a) 0.175 mL b) 17.5 mL c) 175 mL *d) 1750 mL e) 17500 mL

29. What part of an hour elapses between 1:35 am and 1:47 am?

- a) $\frac{1}{12}$ *b) $\frac{1}{5}$ c) $\frac{1}{4}$ d) $\frac{7}{25}$ e) 12

30. Which of the following measurements can be the lengths of the sides of a right triangle?

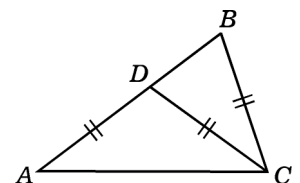
- a) 1.5, 2, 2 b) 1, 2, 3 c) 1.5, 3, 6 d) 3, 3, 3 *e) 1.5, 2, 2.5

31. On three tests, a student's scores were 88, 91 and 87. What must the student score on a fourth test to have an average of exactly 90?

- a) 91 *b) 94 c) 95 d) 98 e) 99

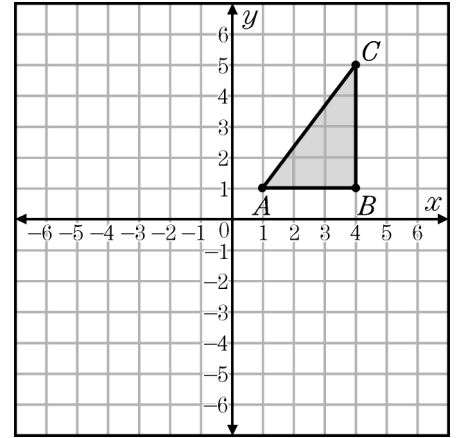
32. In the diagram, $AD = CD = CB$ and $m\angle B = 72^\circ$. What is the degree measure of $\angle A$?

- a) 18 b) 24 *c) 36 d) 44 e) 48



33. If $\triangle ABC$ goes through a 180° rotation about point A , what are the resulting coordinates for point B ?

- a) $(0, -1)$ b) $(2, 0)$ c) $(1, -2)$
 *d) $(-2, 1)$ e) $(-1, 2)$



34. A triangle has area A , base b and height h . If $A = 48$ and $h = 6$, find $\frac{b}{A}$.

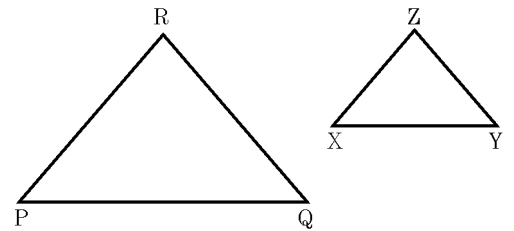
- a) $\frac{1}{8}$ b) $\frac{1}{6}$ *c) $\frac{1}{3}$ d) $\frac{1}{2}$ e) 2

35. Triangle ABC is drawn on a coordinate plane. The hypotenuse has endpoints $A(1, 8)$ and $C(6, 3)$. Find AC .

- a) $\sqrt{10}$ b) $\sqrt{15}$ *c) $5\sqrt{2}$ d) $3\sqrt{5}$ e) 10

36. Triangles PQR and XYZ are similar. Which statement is *not* true?

- a) $\angle R = \angle Z$
 *b) $RQ = YZ$
 c) $\frac{PR}{XZ} = \frac{PQ}{XY}$
 d) $\frac{\text{area of } PQR}{\text{area of } XYZ} = \left(\frac{PQ}{XY}\right)^2$
 e) $\frac{\text{perimeter of } PQR}{\text{perimeter of } XYZ} = \frac{PQ}{XY}$



37. A playing card is found face down on the sidewalk. Assuming it came from a standard 52-card deck, what is the probability that it is a jack or a black card?

- a) $\frac{17}{26}$ b) $\frac{6}{13}$ c) $\frac{1}{2}$ *d) $\frac{15}{26}$

38. Determine the range for this set of numbers:

49, 59, 43, 58, 37, 40, 43

- a) 21 *b) 22 c) 23 d) 43 e) 49

39. The table shows students' pulse rates before a physical education class.

pulse rate	67	68	69	70	71	72	73
number of students	0	3	2	4	1	3	0
pulse rate	74	75	76	77	78	79	80
number of students	2	1	4	5	1	2	1

What is the mode for the pulse rates?

- a) 70 b) 72 c) 74 *d) 77 e) 79

40. José was shopping for pens. The prices of the pens he had to choose from were 93¢, 89¢, 86¢, 93¢, 98¢, 87¢ and 91¢. What is the mean price of the pens?

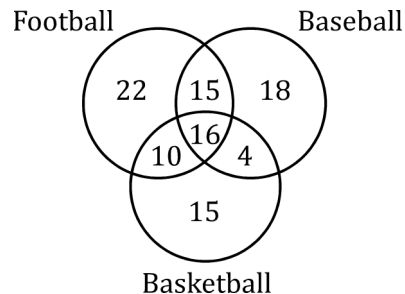
- a) 89¢ *b) 91¢ c) 93¢ d) 94¢ e) 97¢

41. 300 seniors will walk into their graduation ceremony tomorrow. They will be randomly divided into groups of 20. What is the probability that Wayne, a graduating senior, will be in the first group?

- a) $\frac{1}{4}$ b) $\frac{1}{5}$ c) $\frac{3}{10}$ *d) $\frac{1}{15}$ e) $\frac{1}{20}$

42. The diagram shows the number of sports fans who regularly watch football, baseball and/or basketball. If a fan is chosen at random, what is the probability that the person regularly watches *only one* of the three sports?

- a) 0.16 b) 0.29 c) 0.37 d) 0.45 *e) 0.55

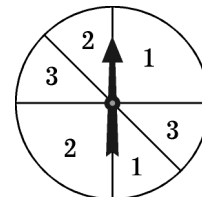


43. A fair coin is flipped four times. The first two flips are tails. What is the probability that the last two flips will be heads?

a) $\frac{1}{8}$ *b) $\frac{1}{4}$ c) $\frac{3}{8}$ d) $\frac{1}{2}$ e) $\frac{3}{4}$

44. On the spinner, all central angles are either 45 or 90 degrees. When spun once, what is the probability of the arrow landing on the number 2?

a) 25% b) $33\frac{1}{3}\%$ *c) $37\frac{1}{2}\%$ d) 40% e) 50%

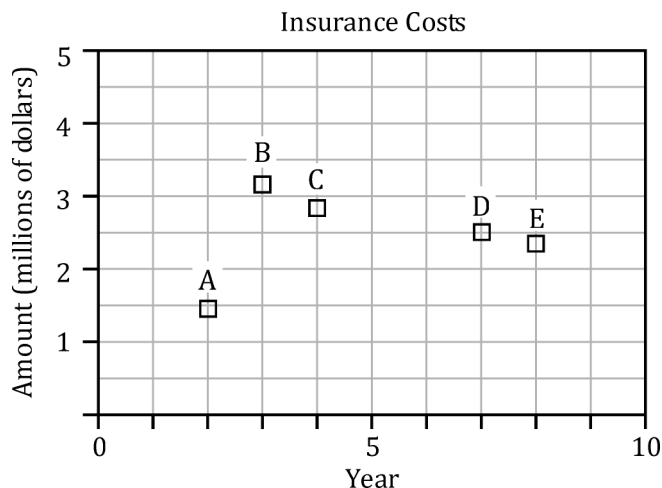


45. A company estimates its insurance costs over the next 10 years. Some of the amounts are shown in this table:

Insurance Costs
(millions of dollars)

Year	2	4	7	9
Amount	2.2	2.6	3.2	3.6

When plotted on the graph, the amounts are all on the same line. Which of the labeled boxes will that line pass through?



a) A b) B *c) C d) D e) E

46.

Bunch	Bananas
<i>A</i>	8
<i>B</i>	7
<i>C</i>	12
<i>D</i>	x
<i>E</i>	10

The table shows the number of individual bananas in 5 different bunches. If the median of the number of bananas in the bunches is 10, which of the following could *not* be the number of bananas in bunch *D*?

- a) 14 b) 12 c) 20 *d) 8

47. At a basketball game, Kaleah is about to shoot two free throws. If she makes 80% of her free throws, what is the probability of her missing the next two?

- *a) $\frac{1}{25}$ b) $\frac{1}{20}$ c) $\frac{24}{25}$ d) $\frac{25}{116}$ e) $\frac{1}{2}$

48. In a survey students were asked to name their favorite sport. The table shows the results.

<i>sport</i>	<i>number of students</i>
basketball	13
soccer	10
football	9
volleyball	9
baseball	7
golf	5
swimming	4
tennis	3

What percent of students named football or volleyball as their favorite sport?

- a) 30 b) 18 *c) 15 d) 9 e) 6