Problem-Attic TSIA 2.0 Samples #2

1. Milton purchased $73.26 worth of goods while shopping at Supra-Mart. He gave the clerk a $100 bill to pay for the goods. How much change should he receive?

   *a) $26.74 b) $27.74 c) $26.76 d) $36.74 e) $73.26

2. What percent of 20 is 75?

   *a) 375% b) 37.5% c) 55% d) $26\frac{2}{3}\%$

3. An engineer built a model of a bridge to show the city council what it will look like. The actual new bridge will be 365 feet long. How long is the model of the bridge if the scale is 1 inch to 10 feet?

   a) 3.65 feet b) 0.365 feet *c) 36.5 inches d) 365 inches e) 3650 inches

4. Which of the following fractions is closest to $\frac{2}{3}$?

   a) $\frac{11}{15}$ *b) $\frac{7}{10}$ c) $\frac{4}{5}$ d) $\frac{1}{2}$ e) $\frac{5}{6}$

5. At the appliance store, a toaster oven has a list price of $110. If it goes on sale for 15% off, and then 6% tax is added, what is the final price?

   *a) $99.11 b) $95.30 c) $100.10 d) $101.00 e) $124.35

6. The ratio of the length to the width of a U.S. flag is always 19 : 10. What is the length of a U.S. flag which has a perimeter of 87 inches?

   a) 5 in b) 9 in c) 19 in *d) 28.5 in e) 33.5 in

7. Air temperature drops about 3.5° F for every 1000 ft above the surface of the earth. Given this relationship, if the ground-level temperature is 60° F, what is the temperature at an altitude of 10,000 ft?

   a) 15° F *b) 25° F c) 35° F d) 56.5° F e) 95° F

8. The table shows the distribution of blood types among patients at the local hospital.

Blood type	O	A	B	AB
Percent of Patients	45%	40%	11%	4%

If there are 200 patients at a hospital, how many have blood type A?

a) 8 b) 22 c) 72 *d) 80 e) 90

9. Evaluate $-9r - 4s$ for $r = 1$ and $s = -2$.

*a) -1 b) 1 c) 5 d) 14 e) 17

10. The illustrator for a graphic novel drew 24 panels in an 8-hour workday. What was the average amount of time, in minutes, the illustrator spent drawing each panel?

a) 3 *b) 20 c) 30 d) 45 e) 192

11. Which of the following statements is *not* true for all real numbers a, b and c?

a) If $a + b = c$, then $c - b = a$.

*b) If $a - b = c$, then $c + a = b$.

c) If $a = b$, then $ac = bc$.

d) If $a \div b = c$ and $b \neq 0$, then $a = bc$.

12. 3^2 is how many times greater than 3^{-2}?

a) 4 b) 9 c) 18 d) 36 *e) 81

13. If $3x + 2y = 1$ and $2y - 3z = 10$, then $x + z =$

a) -1 b) $-\frac{1}{3}$ c) $\frac{1}{9}$ *d) -3 e) 11

14. Solve: $4x - 2y = 5$
$-x + 7y = 2$

*a) $\left(\frac{3}{2}, \frac{1}{2}\right)$ b) $\left(-\frac{3}{2}, \frac{1}{2}\right)$ c) $\left(\frac{3}{2}, -\frac{1}{2}\right)$ d) $\left(-\frac{3}{2}, -\frac{1}{2}\right)$

15. The cost of placing a digital advertisement is given by the formula

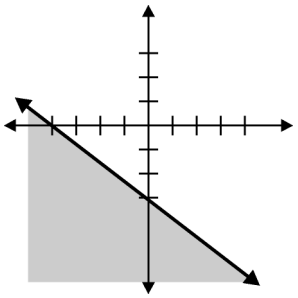
$$C = \$5.00 + \$0.22w$$

where w is the number of words in the advertisement. What is the cost of an advertisement containing 24 words?

a) \$5.22 b) \$5.46 *c) \$10.28 d) \$10.46 e) \$11.10

16. Which graph represents the solution to the inequality $y \leq -\frac{3}{4}x - 3$?

*a)



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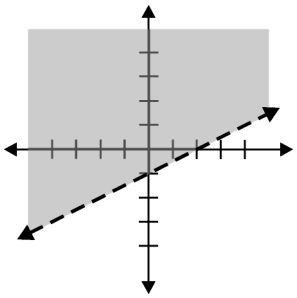

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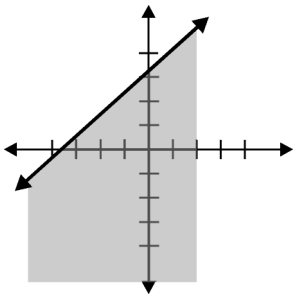

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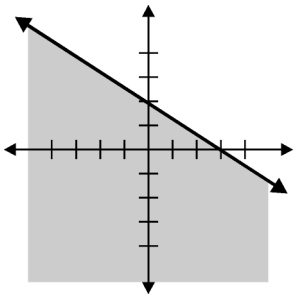

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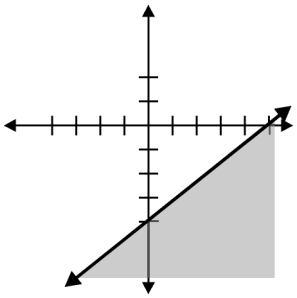


17. If $a^x = b$, then $a^{x+3} =$

a) $3 + b$ *b) $a^3 b$ c) b^3 d) $3b$

18. For $f(x) = 8x - 12$, determine $-\frac{1}{2}f(x)$.

a) -16 b) -8 c) $-x - 6$ *d) $-4x + 6$ e) $4x + 56$

19. The table shows the area that can be covered by an exterior house paint.

Paint (gallons)	Coverage (sq ft)
2	700
8	2800
10	3500
18	6300

Based on the table, how many square feet can you cover with 23 gallons of the paint?

a) 6650 b) 6900 c) 7700 *d) 8050 e) 8225

20. Kim has to complete some work at the rate shown in the table. How many units should be completed on the n^{th} day?

day	1	2	3	4	5	n
units to complete	4	8	12	16	20	?

a) $4 + n$ b) $20 + n$ c) $20n$ *d) $4n$

21. The expression $2x^2 + 8x - 10$ is equivalent to which of the following?

*a) $2(x + 5)(x - 1)$ b) $(x - 10)(x + 2)$ c) $2(x - 5)(x + 1)$ d) $(x + 10)(x - 2)$

22. Multiply: $(-2a^3b^2)(-5ab^3)$

*a) $10a^4b^5$ b) $-10a^3b^6$ c) $10a^3b^6$ d) $-10a^4b^5$

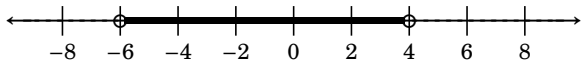
23. In the quadratic equation $x^2 + x - a = 10$, the a represents a positive number. If one solution is 4, what is the other solution?

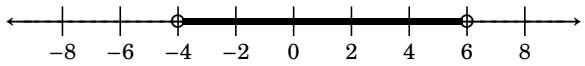
*a) -5 b) -4 c) -2 d) 2 e) 5

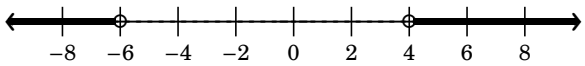
24. Solve: $4|x - 2| = 24$

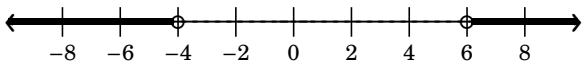
a) 8 *b) 8, -4 c) 4 d) -8, 4

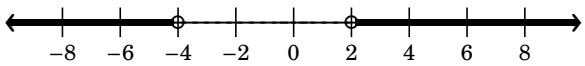
25. Which of the following shows the solution for $n^2 + 2n < 24$?

∗a) 

b) 

c) 

d) 

e) 

26. A rectangle has width W, length L, and an area of 20 square inches. Express the rectangle's perimeter, P, as a function of its width.

a) $WL = 20$ b) $P = W + L$ ∗c) $P = 2W + \frac{40}{W}$

d) $P = 5W + \frac{100}{W}$ e) $P = 2W + \frac{100}{W^2}$

27. In parallelogram $ABCD$, the coordinates of three of the vertices are $A(-3, -4)$, $B(-3, 6)$, and $D(5, -2)$. The coordinates of point C are _____.

a) $(3, 5)$ b) $(3, 8)$ c) $(5, 4)$ ∗d) $(5, 8)$ e) $(8, 5)$

28. In $\triangle ABC$, angles A and B are congruent. Given $m\angle C = 140$, find the degree measure of $\angle B$.

∗a) 20 b) 40 c) 60 d) 110 e) 160

29. A bedroom has dimensions of 4.6 m by 3.8 m. What is the total cost of carpeting the room if the unit cost is $23.00 per square meter?

a) $17.48 b) $344.56 c) $384.56 ∗d) $402.04 e) $420.40

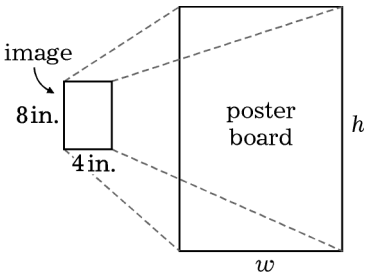
30. A kitchen sink has a length of 24 inches, a width of 14 inches and a depth of 6 inches. If the bottom and sides of the sink are rectangular, how much water can it hold?

a) $24\,\text{in}^3$ b) $140\,\text{in}^3$ c) $336\,\text{in}^3$ d) $1440\,\text{in}^3$ ∗e) $2016\,\text{in}^3$

31. A 4-inch by 8-inch image is projected on to a poster board, as shown. The projection makes it possible to do an accurate trace of the image at a larger size. The width, w, of the poster board is 1 foot 8 inches. What is the height, h?

a) 2 ft 9 in. b) 3 ft c) 3 ft 2 in.

∗d) 3 ft 4 in. e) 4 ft



32. Shape A goes through a transformation to become shape B. If B is similiar to A, but the shapes are *not* congruent, then which of these transformations must have occurred?

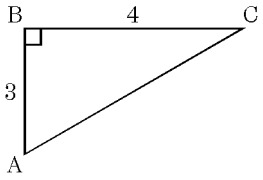
a) translation b) reflection c) rotation ∗d) dilation

33. Find the length of $\overline{GH}$ if the segment has endpoints at $G(-5, 4)$ and $H(3, -2)$.

a) $\sqrt{68}$ b) $5\sqrt{2}$ c) $10\sqrt{2}$ d) 15 ∗e) 10

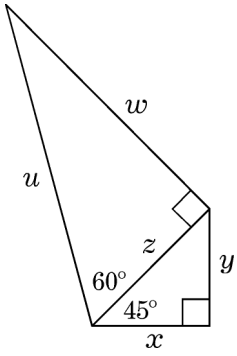
34. Determine the sine of angle A.

a) $\frac{3}{5}$ b) $\frac{3}{4}$ ∗c) $\frac{4}{5}$ d) $\frac{4}{3}$ e) $\frac{5}{3}$



35. Given the figure, if $u = 6$, what is $x + y$?

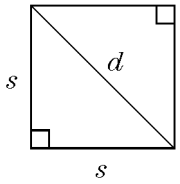
a) 3 ∗b) $3\sqrt{2}$ c) $\frac{3\sqrt{3}}{2}$ d) $4\sqrt{2}$ e) $\frac{3}{2}$



36. A line with slope 3 passes through the point $(0, 10)$. What is the x-coordinate of the point on the line where the y-coordinate is 16?

∗a) 2 b) 5 c) 6 d) 8 e) 12

37. The figure shows a square with side s and diagonal d. Express s in terms of d.



a) $s = \frac{\sqrt{2}}{2}d^2$ b) $s = \sqrt{2}d$ c) $s = \frac{d}{2}$

d) $s = \frac{\sqrt{2}}{d^2}$ *e) $s = \frac{\sqrt{2}}{2}d$

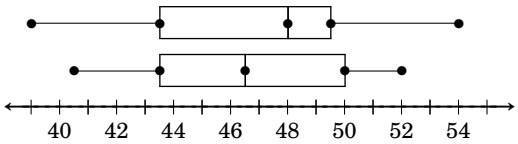
38. A box contains 3 baseballs, 7 softballs, and 11 tennis balls. What is the probability that a ball selected at random will be a tennis ball?

a) $\frac{3}{21}$ b) $\frac{7}{21}$ *c) $\frac{11}{21}$ d) $\frac{10}{21}$

39. A 12-sided die (dodecahedron) is rolled. If the faces show the numbers 1–12, what is the probability of rolling a number greater than 9?

a) $\frac{1}{6}$ *b) $\frac{1}{4}$ c) $\frac{1}{3}$ d) $\frac{5}{12}$ e) $\frac{4}{9}$

40. The box-and-whisker plot represents two sets of data.



Which statement is true about the data?

a) The lower quartiles are equal.
b) The upper quartiles are equal.
*c) The two sets have the same median.
d) The two sets have the same range.

41. In the last six basketball games, Caitlin scored an average of 18 points. In her highest scoring game, she got 33 points. If that game were not included, what would be her average for the other five?

a) 12.5 *b) 15 c) 16.5 d) 18 e) 21

42. One day in September the high temperatures for 10 Texas cities were:

88°, 92°, 88°, 95°, 96°, 92°, 97°, 86°, 99°, 92°

What was the mode of the temperatures?

a) 88° *b) 92° c) 93° d) 97° e) 99°

43. At Southern High School, the chess club has 16 members and the math club has 11 members. If a total of 13 students belong to only one of the two clubs, how many students belong to both clubs?

a) 2 b) 3 *c) 7 d) 14 e) 20

44. A streaming company put out a chart showing the number of viewers for five classic kid movies.

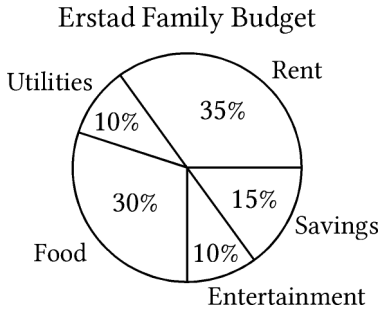
Movie	Number of Viewers
Parent Trap	49,270
The Karate Kid	53,092
NeverEnding Story	27,817
The Mighty Ducks	31,174
Finding Nemo	38,006

What is the difference between the movie with the most number of viewers and the least number?

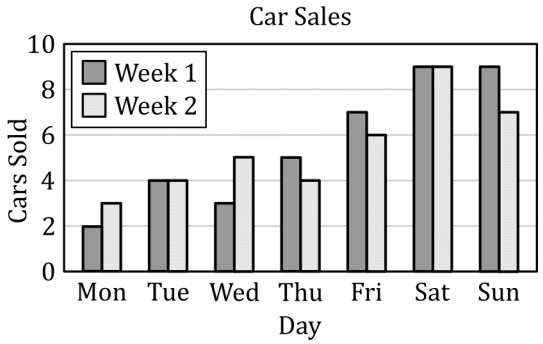
a) 3,822 b) 13,822 c) 25,175 *d) 25,275 e) 34,885

45. The Erstad family budget, shown in the figure, is based on income of $4,500 per month. How much did the family spend on entertainment last month if it was only half of the budgeted amount?

a) $175 *b) $225 c) $324 d) $450



46. The graph shows car sales at a dealership for the first two weeks of the month.



What was the total number of cars sold on Friday and Saturday for week 1 only?

a) 9 b) 13 c) 15 ∗d) 16 e) 18

47. Nailah downloaded three movies from a streaming service: a mystery, a comedy and a drama. Now she has to decide on the order for viewing them. How many different viewing orders are possible?

a) 2 b) 3 c) 4 ∗d) 6 e) 8

48. The circle graph shows the percent of time that workers spend on various jobs. Which of the following is the best estimate for the percent of time spent on manufacturing and training?

a) 40% b) 50% c) 55% ∗d) 70% e) 85%