

Name _____
Mr. Schlansky

Date _____

SAT Prep Assessment

1. To make a certain bakery cookie, the maker needs 2.1 ounces of chocolate. How many pounds of chocolate are needed to make 32 cookies? (1 pound = 16 ounces)

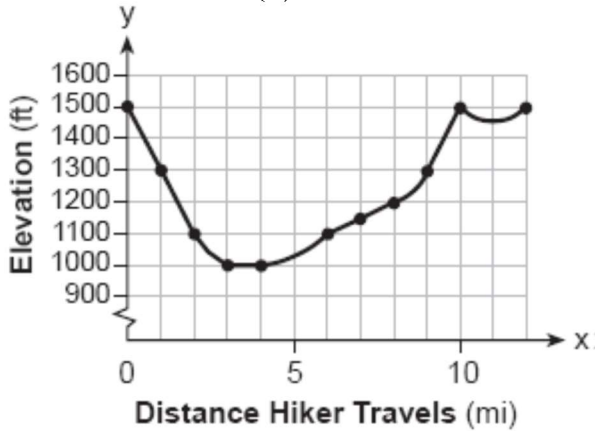
2. $\frac{3}{5}$ of a class did their homework. If there are 20 students in the class, how many students did not do their homework?

3. Byron purchases groceries that total \$52. How much will his bill be after 7% sales tax is added?

4. Chloe wants to buy a car that has an original price of \$8000. The dealership is offering 10% off and her mom will pay for $\frac{1}{4}$ of the final cost. How much will Chloe have to pay without tax?

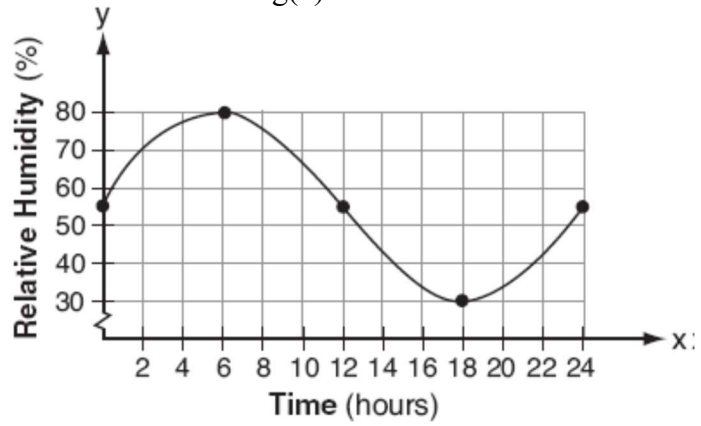
5. A dress with an original price of \$125 went on clearance for \$68.75. What is the percent of decrease of the dress?

6. $f(x)$



a) Evaluate $f(4)$

$g(x)$



b) Evaluate $g(18)$

7. If $f(x) = 5x^2$ and $g(x) = \sqrt{2x}$, what is the value of $(f \circ g)(8)$

8. If $f(x) = x^2$ and $g(x) = 2x + 1$, which expression is equivalent to $(f \circ g)(x)$?

9. The result when $6x^2 - 13x + 12$ is subtracted from $-3x^2 + 6x + 7$ is a polynomial in the form $ax^2 + bx + c$. What is the value of $a + b + c$?

10. The product of $2x^2 + 7x - 10$ and $x + 5$ is expressed in its standard form of $ax^3 + bx^2 + cx + d$. What is $a + b - d$?

11. Solve for h and k : $3x^3 - 8x^2 + 13 = (3x^2 + hx - 4)(x - 2) + k$

12. Rationalize $\frac{3}{2 + 5i}$

13. Divide $\frac{6x^3 - 5x + 3}{x - 3}$

19. A satellite television company charges a one-time installation fee and a monthly service charge. The total cost is modeled by the function $y = 40 + 90x$. Which statement represents the meaning of each part of the function?

- 1) y is the total cost, x is the number of months of service, \$90 is the installation fee, and \$40 is the service charge per month.
- 2) y is the total cost, x is the number of months of service, \$40 is the installation fee, and \$90 is the service charge per month.
- 3) x is the total cost, y is the number of months of service, \$40 is the installation fee, and \$90 is the service charge per month.
- 4) x is the total cost, y is the number of months of service, \$90 is the installation fee, and \$40 is the service charge per month.

20. Dylan invested \$600 in a savings account at a 1.6% annual interest rate. He made no deposits or withdrawals on the account for 2 years. The interest was compounded annually. Find, to the *nearest cent*, the balance in the account after 2 years.

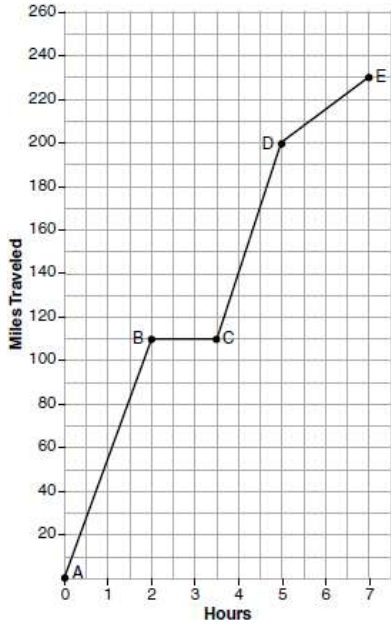
21. The half-life of mendelevium-258 is 51.5 days. Write an equation for the amount of mendelevium-258 remaining from an initial amount of 4000 grams after d days. To the *nearest hundredth of a gram*, how much mendelevium-258 will remain after 12 days?

22. Rewrite $f(x) = x^2 + 6x + 2$ in vertex form and state the vertex

23. For what value of k would $kx^2 + 2x - 5 = 0$ have real roots?

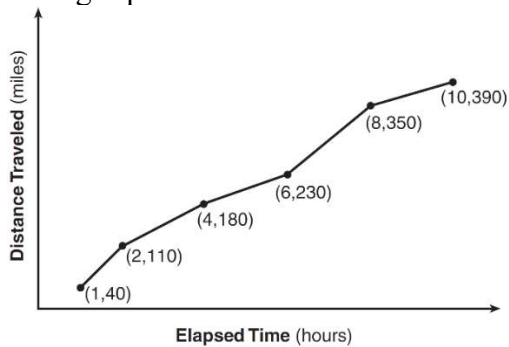
- | | |
|-------|-------|
| 1) -4 | 3) -2 |
| 2) 0 | 4) -5 |

24. The graph below models Craig's trip to visit his friend in another state. In the course of his travels, he encountered both highway and city driving. Based on the graph, during which interval did Craig most likely drive in the city? Explain your reasoning. Explain what might have happened in the interval between B and C .

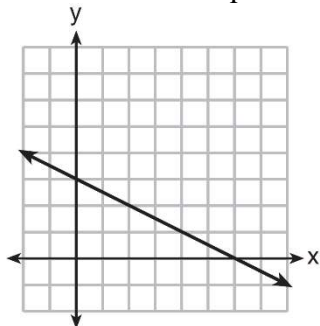


25. The Jamison family kept a log of the distance they traveled during a trip, as represented by the graph below.

During which interval was their average speed the greatest? During which interval was their average speed the least?



26. What is the equation of the line given below?

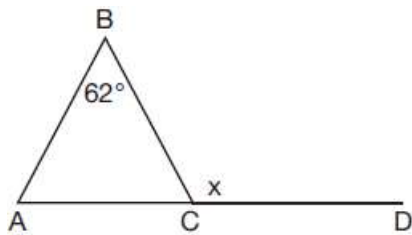


27. The number of people who attended a school's last six basketball games increased as the team neared the state sectional games. The table below shows the data. Write a linear function that represents this data.

Game	13	14	15	16	17	18
Attendance	348	435	522	609	696	783

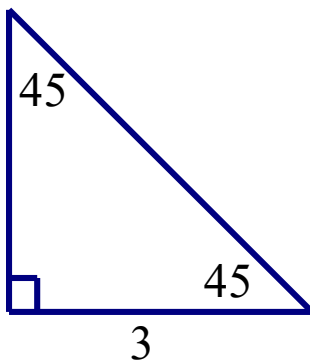
28. In right triangle ABC with the right angle at C , $\sin A = 2x + 0.1$ and $\cos B = 4x - 0.7$. Determine and state the value of x . Explain your answer.

29. Given $\triangle ABC$ with $m\angle B = 62^\circ$ and side \overline{AC} extended to D , as shown below. Which value of x makes $\overline{AB} \cong \overline{CB}$?

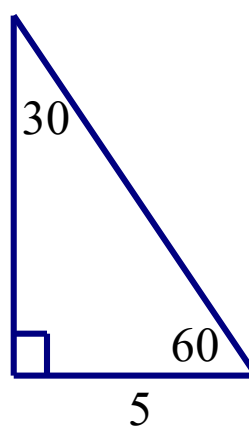


30. Fill in the two missing sides of each of the following triangles.

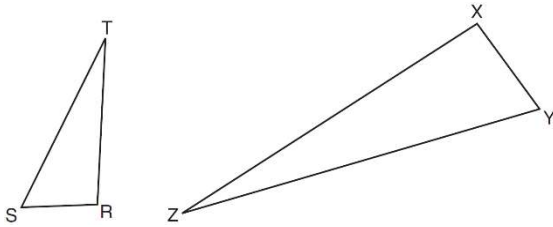
a)



b)



31. Triangles RST and XYZ are drawn below. If $RS = 6$, $ST = 14$, $XY = 9$, find YZ .

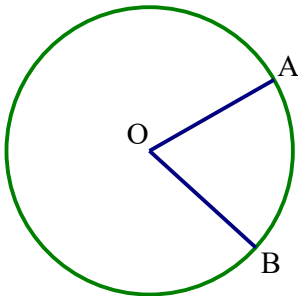


32. What is the volume of a cylinder whose height is 12 inches and whose diameter is 20 inches in terms of π ?

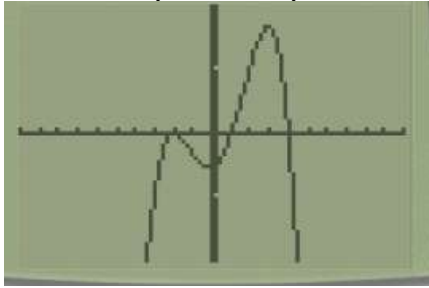
33. The base of a pyramid is a rectangle with a width of 6 cm and a length of 8 cm. Find, in centimeters, the height of the pyramid if the volume is 288 cm^3 .

34. Find the center and radius of $x^2 + 8y + 10 + y^2 - 4x = 6$

35. In the circle below, $m\angle AOB = \frac{\pi}{3}$. If the circumference of the circle is 18π , find arc AB.



36. Write a possible equation of the following polynomial function.



37. Consider the polynomial $p(x) = x^3 + kx^2 + x + 6$. Find a value of k so that $x + 1$ is a factor of P . Find all zeros of the polynomial.

38. Express in simplest form:

$$\sqrt[3]{\frac{x^{-6}y^{12}}{27z^{-9}}}$$

39. The set of data in the table below shows the results of a survey on the number of messages that people of different ages text on their cell phones each month.

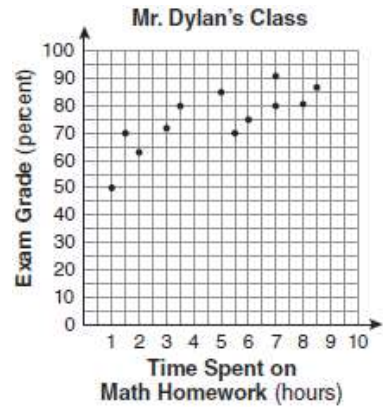
Age Group	Text Messages per Month		
	0–10	11–50	Over 50
15–18	4	37	68
19–22	6	25	87
23–60	25	47	157

If a person from this survey is selected at random, what is the probability that the person texts over 50 messages per month given that the person is between the ages of 23 and 60?

40. The number of hours spent on math homework each week and the final exam grades for twelve students in Mr. Dylan's algebra class are plotted below.

Based on a line of best fit, which exam grade is the best prediction for a student who spends about 4 hours on math homework each week?

- 1) 62 3) 82
- 2) 72 4) 92



41. Sara's test scores in mathematics were 64, 80, 88, 78, 60, 92, 84, 76, 86, 78, 72, and 90. Determine the mean, the median, lower quartile, upper quartile, range, interquartile range, population standard deviation, and the mode of Sara's test scores.

42. On Jessica's first four math tests, she scored 74, 89, 80, and 82. What would Jessica have to score on her fifth math test to bring her average to an 84?

43. A track team has 24 sprinters and 10 distance runners. How many additional distance runners would have to be added onto the team so that the team would have 40% distance runners?

44. The values of 11 houses on Washington St. are shown in the table below. State which measure of central tendency, the mean or the median, *best* represents the values of these 11 houses. Justify your answer.

Value per House	Number of Houses
\$100,000	1
\$175,000	5
\$200,000	4
\$700,000	1

45. Which survey is *least* likely to contain bias?

- 1) surveying a sample of people leaving a movie theater to determine which flavor of ice cream is the most popular
- 2) surveying the members of a football team to determine the most watched TV sport
- 3) surveying a sample of people leaving a library to determine the average number of books a person reads in a year
- 4) surveying a sample of people leaving a gym to determine the average number of hours a person exercises per week

46. A survey was conducted in a high school and it was found that 90% of the sample of students use SnapChat. Which of the following would be a valid conclusion to draw?

- 1) 90% of the students in the high school use SnapChat.
- 2) Approximately 27 students in a randomly chosen English class of 30 use SnapChat.
- 3) 9 out of the first 10 students that walk in the building in the morning use SnapChat.
- 4) Approximately 90% of SnapChat users are high school students.

47. If $2(4z + 3) = 7z + 4$, find the value of $3z^2$

48. The equation for the volume of a cylinder is $V = \pi r^2 h$. The positive value of r , in terms of h and V , is

- 1) $r = \sqrt{\frac{V}{\pi h}}$
- 2) $r = \sqrt{V\pi h}$
- 3) $r = 2V\pi h$
- 4) $r = \frac{V}{2\pi}$

49. For what value of a does the equation $5x - 2 = 5x + a$ have infinitely many solutions?

- 1) 5 3) 2
2) -5 4) -2

50. Solve the following systems of equations for x and y

$$\begin{aligned} 2x + y &= 3 \\ -x + 3y &= -12 \end{aligned}$$

51. Solve the following systems of equations for x and y

$$\begin{aligned} y &= x + 3 \\ 3x + 2y &= 26 \end{aligned}$$

52. If $3xy + 3z - 4 = 8$, what is the value of $xy + z$?

53. Alicia purchased H half-gallons of ice cream for \$3.50 each and P packages of ice cream cones for \$2.50 each. She purchased 14 items and spent \$43. Which system of equations could be used to determine how many of each item Alicia purchased?

- | | |
|-------------------------|-------------------------|
| 1) $3.50H + 2.50P = 43$ | 3) $3.50H + 2.50P = 14$ |
| $H + P = 14$ | $H + P = 43$ |
| 2) $3.50P + 2.50H = 43$ | 4) $3.50P + 2.50H = 14$ |
| $P + H = 14$ | $P + H = 43$ |

54. Which of the following equations has no solution?

1) $|x+a|+4=3$

2) $|x-a|+2=3$

3) $|x+a|-5=-4$

4) $|x-a|+3=9$

55. Solve for x:

$$4|2x+3|-3=17$$

56. Solve for x:

$$27^x = 9^{x+2}$$

57. Solve for m:

$$\frac{1}{m+10} + \frac{1}{5} = \frac{3}{m+10}$$

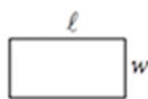
58. Solve for x:

$$x = 2 + \sqrt{x+4}$$

REFERENCE



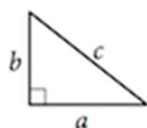
$$A = \pi r^2$$
$$C = 2\pi r$$



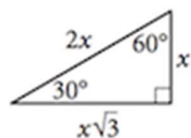
$$A = \ell w$$



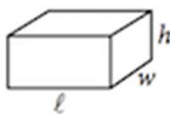
$$A = \frac{1}{2}bh$$



$$c^2 = a^2 + b^2$$



Special Right Triangles



$$V = \ell wh$$



$$V = \pi r^2 h$$



$$V = \frac{4}{3}\pi r^3$$



$$V = \frac{1}{3}\pi r^2 h$$



$$V = \frac{1}{3}\ell wh$$

The number of degrees of arc in a circle is 360.

The number of radians of arc in a circle is 2π .

The sum of the measures in degrees of the angles of a triangle is 180.