

- 1. Consider the following set of numbers:

$$\{-5.\bar{1}, -\sqrt{9}, -\frac{\pi}{2}, 0, 0.25, 4\frac{6}{7}, \sqrt{27}, \sqrt{36}\}$$

List the numbers in the set that are:

- | | |
|--------------------|-----------------------|
| a. natural numbers | d. rational numbers |
| b. whole numbers | e. irrational numbers |
| c. integers | f. real numbers |

- [s] 2. Graph each of the numbers from the above set on a number line.



- 3. Insert either $>$, $<$ or $=$ between the two numbers to make a true statement.

a. $\sqrt{25}$ $\sqrt{27}$ b. $\sqrt{27}$ $\sqrt{36}$ c. $|\sqrt{2}|$ $|\sqrt{2}|$

- 4. Complete the following.

- | | |
|--|--|
| a. What is $ \sqrt{3} $? | d. Convert $4\frac{3}{5}$ to an improper fraction. |
| b. What is $\frac{0}{4}$? | e. Convert $\frac{24}{7}$ to a mixed number. |
| c. Convert $\frac{2}{9}$ into a decimal. | |

- 5. Write each English sentence as an algebraic equation. Let the variable x represent the number.

- a. The quotient of 7 and a number yields 5. b. 5 less than three times a number is 2.

[] 6. Perform the indicated operation

a. $-\frac{3}{7} - (-\frac{2}{5})$

c. $\frac{10}{21} (-\frac{7}{25})$

b. $\frac{7}{15} - (-\frac{5}{12})$

d. $\frac{12}{25} \div \frac{14}{15}$

[] 7. State the multiplicative inverse of each number.

a. $\frac{1}{6}$

b. $-\frac{5}{21}$

[] 8. Use order of operations to simplify the following arithmetic expressions.

a. $18 - 3(3 - 8)^3$

c. $(-\frac{1}{3})^2 - (\frac{5}{9} - \frac{2}{3})^2 (9)$

b. $\frac{4(-4+3)^5-7}{2^3-2(-3+1)^2}$

d. $-|14 - (12 - 22)|$

□ 9. Evaluate $-2x^2 - x$ for $x = -\frac{2}{3}$.

□ 10. Simplify each algebraic expression.

a. $5 - (2x + 8)$

b. $13x^2 + 1 - 2[5(x^2 + 2) - 5]$

□ 11. Determine whether or not $-4\frac{1}{2}$ is a solution to $-5 - 3x = -x + 4$.

□ 12. Answer the following questions regarding the polynomial

$$3x - 12x - 18 + 5x.$$

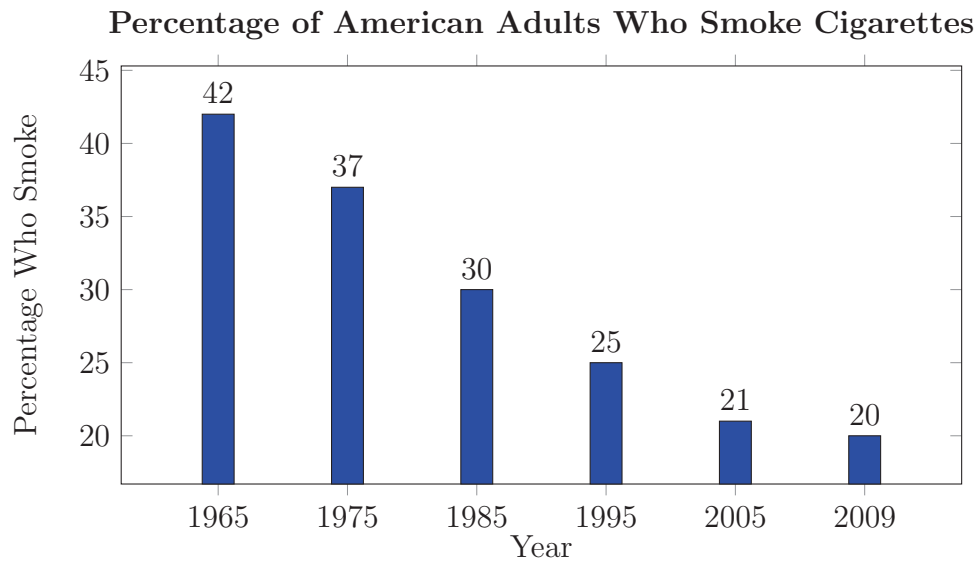
a. How many terms does it have?

c. What is the coefficient of the 2nd term?

b. What is the constant term?

d. Are there any like terms? If so, list them using commas.

- 13. In the years after warning labels were put on cigarette packs, the number of smokers dropped from approximately two in five adults to one in five. The bar graph shows the percentage of American adults who smoked cigarettes for selected years from 1965 through 2009.



The following mathematical model approximates the percentage of American Adults who spoke cigarettes, C , where x is the number of years after 1965.

$$C = -0.5x + 41$$

Use the mathematical model to determine the percentage of American adults who smoked cigarettes in 2005. How does this compare with the actual percentage shown by the bar graph?

- 14. Solve the equation. State your answers in set notation. If there is **exactly one** solution then **show a check**.

a. $2x - 9 + 8x = 5(2x - 3) + 6$

d. $-7(x + 2) + 3x = -(3x + 8)$

b. $\frac{3x}{4} - \frac{1}{2} = \frac{5x}{6} + \frac{1}{3}$

e. $\frac{20}{x} = \frac{5}{3}$

c. $3(2x - 5) = -12 + 6x$

f. $S = P + Prt$ for t

- 15. Translate the given sentence into an algebraic equation using x as the number. Then solve the equation for x . Then answer the question using a complete sentence.

The difference between 3 times a number and 10 results in the quotient of 5 and 2, subtracted from the quotient of a number and 2. What is the number?

- 16. Translate the following questions into algebraic equations, solve the equation and then answer the question using a complete sentence.

a. What is 8% of 300?

c. 18 is what percent of 90?

b. 8 is 40% of what?

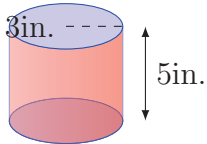
- 17. Solve the inequality. Write the solution on a number line, using interval notation and set notation.

a. $2x + \frac{3}{5} \geq -\frac{7}{5}$

b. $7x - (x + 1) > 6(x + 3) - 20$

- 22. The circumference of a circle is 14π inches. Find the circle's radius and diameter.

- 23. What is the volume of the following figure?



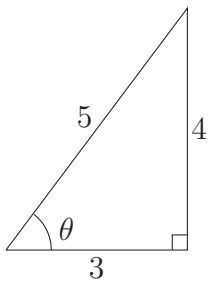
- 24. One angle of a triangle is twice as large as another. The measure of the third angle is 20 deg more than that of the smallest angle. Find the measure of each angle.

- 25. The measure of an angle's supplement is 10 deg more than three times that of its complement. What is the measure of the original angle?

- 26. Which one of the following is a better buy: a large pizza with a 14-inch diameter for \$12.00 or medium pizza with a 7-inch diameter for \$5.00?

- 27. You and your math friend are sitting in the restaurant and you each are enjoying a good cup of coffee while you wait for your food. He pulls out his laptop and connects to the internet via WiFi (isn't the future fantastic?!) to look up how many milligrams of caffeine are in his cup of coffee. The web page he finds explains that there are approximately 120 milligrams of caffeine in a 12 oz cup of coffee. However, the waiter informs you that your cups are 16 oz. How many milligrams of caffeine are in each of your cups of coffee?
- 28. The next weekend, you and your math friend decide to get out of town and go fishing at Diamond Lake. The fish and wildlife officer comes along and, after checking your fishing license (which you of course bought), starts chatting with you about the number of fish in the lake. He explains that they tagged 2,000 trout at the beginning of the month and of the 2,400 fish caught since then, only 12 have been tagged. Approximately how many trout is the lake supporting?

29. Evaluate the three trigonometric functions of the angle θ shown in the given right triangle.



30. Find the lengths of the sides of the triangle (x and y) accurate to 3 decimal places.

