

# Pre Algebra

## Diagnostic Test

### Rules

- This diagnostic test consists of questions from all chapters of the course. If the student scores at least 90% in this test, then the student can skip this course. Signup for the next course.
- If the student scored less than 90% of this test, then you should join this course.
- The student should try to answer all of the questions without a calculator and without any help. No time limit and no negative scoring.
- Each question carries 1 point. Total number of answers are 43. You should score at least 39 out of 43 to score 90% or above.
- Answers are provided at end of test. Print this test if possible but keep the answer sheet away until end of test.

Choose the letter of the best words to describe these sets.

\_\_\_\_\_ ① {0, 2, 4, 6, 8, ...}

a. Odd numbers

\_\_\_\_\_ ② {0, 1, 2, 3, 4, 5, ...}

b. Integer numbers

\_\_\_\_\_ ③ {1, 3, 5, 7, 9, ...}

c. Whole numbers

\_\_\_\_\_ ④ {..., -3, -2, -1, 0, 1, 2, ...}

d. Perfect square numbers

\_\_\_\_\_ ⑤ {1, 4, 9, 16, 25, 36, ...}

e. Even numbers

Are these numbers rational (RAT) or irrational (IRRAT)?

⑥ .7 \_\_\_\_\_

⑨  $\sqrt{28}$  \_\_\_\_\_

⑦ -4.25 \_\_\_\_\_

⑩  $\sqrt{16}$  \_\_\_\_\_

⑧  $\frac{5}{6}$  \_\_\_\_\_

⑪  $\sqrt{7}$  \_\_\_\_\_

Solve the following.

12  $-10 + 3 + (-12)$

13  $-(-23)$

14  $|-9|$

15  $-72 \div -18$

16  $34 \div 0$

17  $-94 \div -47$

18  $-7 \cdot -13 \cdot 1,000$

19  $(-12)^2$

20  $-\frac{4}{5} + (\frac{1}{5})$

21  $-\frac{3}{8} + (-\frac{2}{8})$

22  $-6.5 + (-8.5)$

23  $-9 + .08$

24  $-8\frac{3}{4} + (-7\frac{1}{8})$

25 Jim drove 200 miles and used up 5.5 gallons of gas. Write this as a rate. Then write it as a unit rate.

26  $\frac{8}{20} = \frac{2}{n}$        $n =$

27  $\frac{1}{8} = \frac{n}{100}$        $n =$

28 Ana bought a pair of shoes for \$42.80 including sales tax. She could not remember the original price, but she knew the sales tax rate in her state was 7%. What was the cost of the shoes before the tax? Use a proportion to solve this problem.

29 Find the quotient:  $\frac{6nm^7}{12nm^9}$ .

30 Write .000068 in scientific notation.

31  $\sqrt[3]{125}$

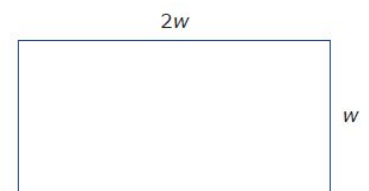
32  $6\sqrt{16} - \sqrt{64}$

33

Marta wants to save more than \$500 to buy her mother a new TV. Her older brother gave her \$120 to start. Each month she wants to save \$40. How many months will she have to save to reach her goal?

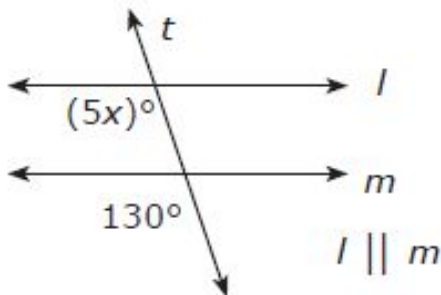
34

In this rectangle, the length is twice the width. If the perimeter is 120 feet, what are the dimensions of the rectangle?

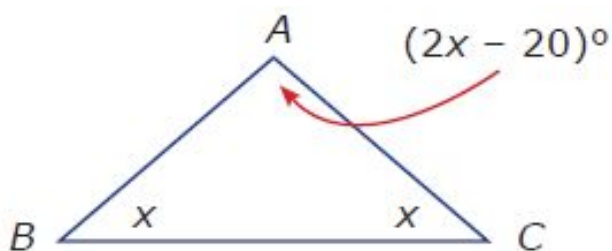


Find the missing  $x$  in the figures below. The figures are not to scale.

35

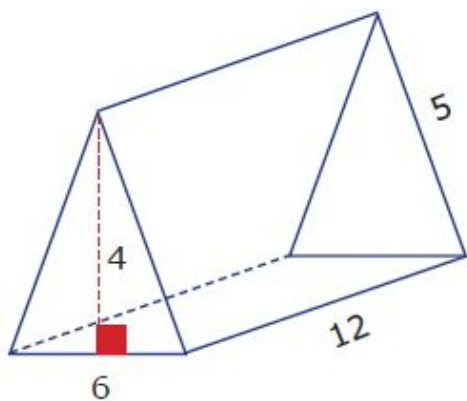


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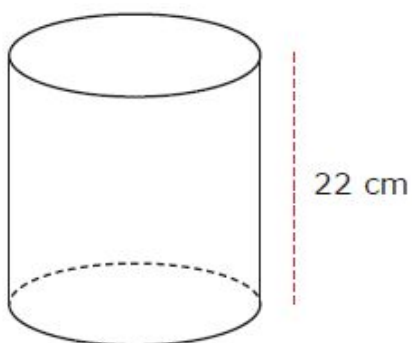


Find the volume and the surface area of the following prisms.

37



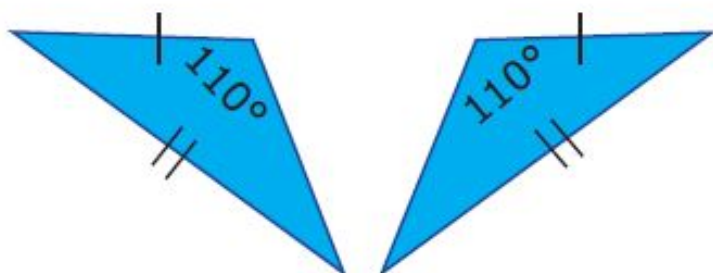
38



Diameter: 10 mm

39 Solve for  $y$ :  $4x + 8y = 4$

40 Given the following pairs of triangles and the information provided, state if these triangles are congruent and by what reason (SSS, SAS, ASA). If not congruent, write "not congruent."



41 Which of the following is a quadratic equation?

- a.  $y = 5x + 2$       b.  $y = 3^x$       c.  $y = x$       d.  $y = 2x^2 - 5$

42 Which of the following is an exponential equation?

- a.  $y = 3(5)^x$       b.  $x = 0$       c.  $y = 2x + 6$       d.  $y = |x|$

43

Bobby has 6 marbles in a can. He has 3 red marbles, 1 blue marble and 2 green marbles. Bobby reaches without looking and chooses one marble. He gives the marble to his friend (without replacement) and then reaches to choose another marble. Show the sample space and find the following probabilities.

a.  $P(\text{red, red}) = \underline{\hspace{2cm}}$

b.  $P(\text{red, blue}) = \underline{\hspace{2cm}}$

c.  $P(\text{green, red}) = \underline{\hspace{2cm}}$

d.  $P(\text{blue, blue}) = \underline{\hspace{2cm}}$



## Answer Keys

1. E
2. C
3. A
4. B
5. D
6. RAT
7. RAT
8. RAT
9. RAT
10. RAT
11. IRRAT
12. -19
13. 23
14. 9
15. 4
16. Undefined
17. 2
18. 91,000
19. 144
20.  $-\frac{3}{5}$
21.  $-\frac{5}{8}$
22. -15
23. -8.92

24.  $-15 \frac{7}{8}$

25. Rate:  $\frac{200 \text{ mi}}{5.5 \text{ gal}}$

Unit Rate:  $\frac{36.4 \text{ mi}}{1 \text{ gal}}$

26.  $n = 5$

27.  $n = 12.5$

28.

$$\$40.00 \left( \frac{42.80}{n} = \frac{107}{100} \right)$$

29.  $\frac{1}{2m^2} = \frac{m^{-2}}{2}$

30.  $6.8 \times 10^{-5}$

31. 5

32. 16



## Answer Keys

33. Let  $n$  = number of months.  
 Inequality:  $120 + 40n > 500$ .  
 $n > 9.5$  Marta has to save for at least 9.5 months.

34. Let  $n$  = a number. Equation:  
 $n - 11 = 24$ .  $n = 35$ . The missing number is 35.

35.  $X = 26$

36.  $m\angle x = 50^\circ$ ,  $m\angle A = 80^\circ$ ; It is an isosceles triangle. It has two congruent angles and two congruent sides.

37.  $V = 144 \text{ units}^3$   $SA = 216 \text{ units}^2$

38.  $270\pi \text{ mm}^2$

39.  $y = -\frac{1}{2}x + \frac{1}{2}$

40. Not Congruent

41. D

42. A

43. a.  $RR: \frac{6}{30}$  or  $\frac{1}{5}$       c.  $GR: \frac{6}{30}$  or  $\frac{1}{5}$   
 b.  $RB: \frac{3}{30}$  or  $\frac{1}{10}$       d.  $BB: 0$

2. Sample Space

