



This is a self-test to determine if the Geometry Prep Class is suitable for your student.

A student who is ready for this intensive class should be able to answer correctly **20 of the Fundamentals problems and 3 of the Problem-Solving problems correctly within 1 hour. No calculator is allowed.** If a student struggles with these problems, then the student should consider reviewing his or her Algebra 1 skills and basic Geometry, possibly through our FlexMath program.

Fundamental problems:

1. Compute: $((-3)^2 - 7)^3 - ((-2)^2)^3 = (9 - 7)^3 - (4)^3 = 2^3 - 4^3 = 8 - 64 = -56$

2. Compute: $(-\frac{1}{3})^{-6} = 729$

3. Compute: $2^{-3} = \frac{1}{8}$

4. Compute: $10000^{\frac{1}{2}} = 100$

5. Compute: $\sqrt{20} + 2\sqrt{45} - 3\sqrt{500} = -22\sqrt{5}$

6. Factor out the greatest common factor of each term: $-64t^2 + 16t + 8 = 8(-8t^2 + 2t + 1)$

7. Factor out the greatest common factor of each term: $81z^3 - 27z + 9z^2 = 9z(9z^2 - 3 + z)$

8. Simplify: $\frac{21t}{3t^2+6t} = \frac{7}{t+2}$

9. Simplify: $\frac{3x^2-9x}{4x^3-12x^2} = \frac{3x(x-3)}{4x^2(x-3)} = \frac{3}{4x}$

10. Simplify: $\frac{8y-3x}{3} + \frac{-7y+5x}{4} = \frac{32y-12x-21y+15x}{12} = \frac{11y+3x}{12}$

11. Solve: $\frac{5x-4}{2} = \frac{16x+1}{7} \quad x = 10$

12. Solve: $-10\sqrt{x-5} + 3 = -57 \quad x = 41$

13. Solve: $|x - 3| > 4 \quad x < -1 \text{ or } x > 7.$

14. Solve: $(\frac{x}{2} - 5)(x + 1) \geq 0 \quad x \leq -1 \text{ or } x \geq 10$

15. Solve: $-3 \cdot |19x| + 11 \geq -46 \quad -1 \leq x \leq 1$

16. Subtract: $(x^7 - 13x^4 + 5x - (-2)) - (-2x^7 - 13x^4 - 5x^2 + x + 5) = 3x^7 + 5x^2 + 4x - 3$

17. Multiply: $(x^3 - 27x - 9) \times (x - 1) = x^4 - x^3 - 27x^2 + 18x + 9$

18. Divide: $(x^3 + 9x^2 - x - 9) \div (x^2 - 1) = x + 9$

19. Find the numerical value: $\frac{2^{-3} \cdot 4^3}{8^{-2}} = \frac{2^{-3} \cdot 2^6}{2^{-6}} = 2^3 \cdot 2^6 = 2^9 = 512$

20. Find the numerical value: $\frac{3^{-12} \cdot 9^5}{27^{-4} \cdot 3^{12} \cdot 9^{-2}} = \frac{3^{-12} \cdot 3^{10}}{3^{-12} \cdot 3^{12} \cdot 3^{-4}} = \frac{3^{-2}}{3^{-4}} = 3^2 = 9$

21. Solve: $6x^2 - 48 = -12x \quad x_1 = 2, x_2 = -4$

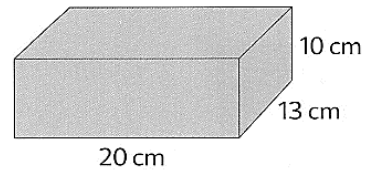
22. Solve: $5x^2 - 60 = -20x \quad x_1 = 2, x_2 = -6$

Problem Solving

1. Find the surface area and the volume of the following figure.

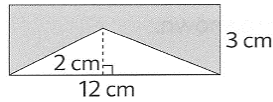
$$SA = 2(20 \times 13 + 13 \times 10 + 20 \times 10) = 1180 \text{ cm}^2$$

$$\text{Volume} = 20 \times 13 \times 10 = 2600 \text{ cm}^3$$



2. Find the shaded area of the rectangle.

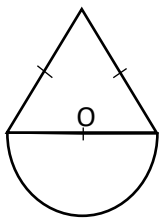
$$\text{Area} = 24 \text{ cm}^2$$



3. Find the radius of each circle or part-circle in each figure.

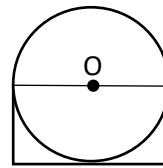
- a. Perimeter of the equilateral triangle is 36 cm.

- b. Perimeter of the rectangle is 24 cm.



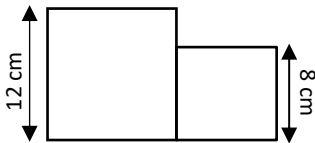
$$d = 36 \div 3 = 12$$

$$r = 12 \div 2 = 6 \text{ cm}$$



$$r = 24 \div 6 = 4 \text{ cm}$$

4. The figure below is made up of two squares. What is the perimeter of the figure? Show your work.



$$\text{Perimeter} = (20 + 12) \times 2 = 64 \text{ cm}$$

5. Find $\angle x$.

$$36^\circ$$

