

Final Test — Form A

8.NS

8.EE

8.F

8.G

8.SP

Name _____ Date _____

Grade 8 math final — all topics. Show your work and write each answer in simplest form.

1. Is $\sqrt{49}$ rational or irrational? Is $\sqrt{20}$ rational or irrational?
2. Evaluate the square root and the cube root: $\sqrt{81}$ and $\sqrt[3]{64}$.
3. Simplify using the properties of exponents. Write your answer with a positive exponent.

$$\frac{2^3 \cdot 2^4}{2^5}$$

4. Between which two consecutive whole numbers does $\sqrt{50}$ lie? Which one is it closer to?
5. Write 5^{-2} as a fraction in simplest form.
6. Multiply and write the result in scientific notation.

$$(3 \times 10^4)(2 \times 10^{-7})$$

7. Write 5,200,000 in scientific notation.
8. Which expression is equivalent to $\frac{x^5}{x^2}$?

A) x^7

C) x^{10}

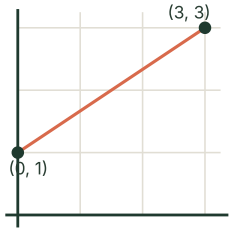
B) x^3

D) $x^{2/5}$
9. Does the table represent a function? Explain.

x	1	2	2	4
y	3	5	7	9

10. The function $f(x) = 3x - 5$ gives the number of laps a swimmer finishes after x practices. Find $f(4)$.

11. Find the slope of the line through the two marked points on the graph.



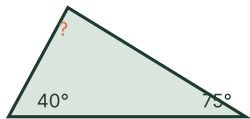
12. Solve for x : $\frac{x}{2} + 3 = 11$.

13. Solve the multi-step equation: $3(2x - 4) = 2x + 4$.

14. Find the slope and y -intercept of the line, then write the equation $y = mx + b$.

x	0	1	2
y	50	75	100

15. Two angles in the triangle measure 40° and 75° . Find the measure of the third angle.



16. Reflect the point $(3, 4)$ across the y -axis. Give the coordinates of the image.

17. Which point is the image of $(4, 2)$ after a rotation of 90° counterclockwise about the origin?

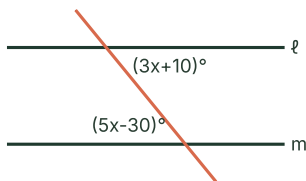
A) $(2, 4)$

B) $(-2, 4)$

C) $(2, -4)$

D) $(-4, -2)$

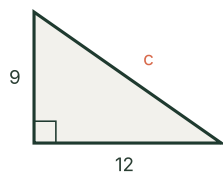
18. Lines ℓ and m are parallel and cut by a transversal. The marked angles are alternate interior angles. Solve for x .



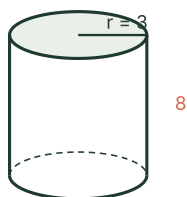
19. Solve the system of equations.

$$\begin{cases} y = 2x - 1 \\ x + y = 5 \end{cases}$$

20. A right triangle has legs of length 9 and 12. Find the length of the hypotenuse.



21. Find the volume of the cylinder in terms of π .

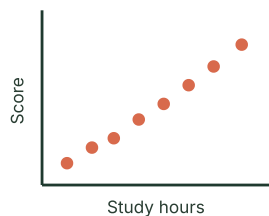


22. A cone-shaped cup has radius 6 cm and height 10 cm. Find its volume in terms of π .

23. A ball has radius 3 in. Find the volume of the sphere in terms of π .

24. Find the length of the leg labeled b in simplest radical form, given the hypotenuse is $\sqrt{52}$ and one leg is 6.

25. The scatter plot compares hours spent studying to test scores for several students. Describe the association (positive, negative, or none) and the strength.



26. At a school basketball game, adult tickets cost \$8 and student tickets cost \$5. The booster club sold 30 adult tickets and 45 student tickets. How much money did they collect in all?
27. The school pep band uses two text plans. Plan A charges a \$20 flat fee plus \$0.10 per text. Plan B charges \$0.30 per text with no flat fee. For how many texts do the two plans cost the same, and what is that cost?
28. A ladder leans against the school gym wall. The foot of the ladder is 5 ft from the wall and the ladder is 13 ft long. How high up the wall does the ladder reach?