

# Practice Test

Big Idea: The principles and processes underlying operations with numbers apply equally to algebraic situations and can be described and analyzed.

## Core Skill #1: Evaluating square root in rational and irrational form. Apply Pythagorean Theorem

1. Simplify if possible, if not write "no solution"

a)  $\sqrt{89 - 8}$

$$\sqrt{81} = 9$$

Ans) 9

b)  $\sqrt{-5 + 2}$

$\swarrow$   
 $\searrow$   
-ve

Ans) no sol

2. Simplify  $\sqrt{0} + \sqrt{144}$

$$0 + 12$$

Ans) 12

3. Simplify  $\sqrt{\frac{4}{25}}$   $\frac{\sqrt{4}}{\sqrt{25}} = \frac{2}{5}$

Ans)  $-\frac{2}{5}$

4. Simplify  $\sqrt{0.36}$

$$\sqrt{\frac{36}{100}} \rightarrow \frac{6}{10}$$

Ans)  $\frac{3}{5}$

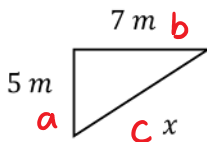
5. Estimate to 1 decimal point using the number line method

a)  $-\sqrt{78}$



Ans) -8.8

6. Find the length "x" using Pythagorean Theorem  $a^2 + b^2 = c^2$ , and use the number line to evaluate the answer to 1 decimal point.

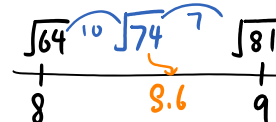


$$c^2 = a^2 + b^2$$

$$c^2 = 5^2 + 7^2$$

$$c^2 = 25 + 49$$

$$c^2 = 74$$



Ans) 8.6 m

7. Estimate  $\sqrt{53}$  to 2 decimal points using Heron's Method  $\sqrt{x} \approx \frac{1}{2}(a + \frac{x}{a})$

Closest  $a = \sqrt{49} = 7$

$$\sqrt{49} \quad \sqrt{51}$$

$$\downarrow$$

$$7$$

$$\sqrt{53} \approx \frac{1}{2} \left[ 7 + \frac{53}{7} \right]$$

$$= \frac{1}{2} \left[ \frac{49}{7} + \frac{53}{7} \right]$$

$$= \frac{1}{2} \left[ \frac{102}{7} \right]$$

$$= \frac{51}{7}$$

$$7 \overline{) 51.0}$$

$$\underline{49}$$

$$20$$

$$\underline{14}$$

$$60$$

$$\underline{56}$$

$\therefore \sqrt{53} \approx 7.28$

## Core Skill #2: Using exponents to describe numbers (Sec 1.4) p.21-26

8. Write each expression as a power. Identify the base and the exponent in each power. Then, evaluate

	Power	Base	Exponent	Evaluate
a) $-5 \times 5 \times 5$	$-5^3$	<u>5</u>	<u>3</u>	<u>-125</u>
b) $(-4)^3$	$(-4)^3$	<u>-4</u>	<u>3</u>	<u>-64</u>

9. Circle positive or negative for the values

- a)  $-5^2$  + /  $\ominus$
- b)  $-(-2 + 5)^4$  + /  $\ominus$
- c)  $-(-7)^3$   $\oplus$  /  $\ominus$

10. Write the power as repeated multiplication. Then, evaluate

	Repeated Multiplication	Evaluate
a) $-(2)^3$	$-2 \times 2 \times 2$	<u>-8</u>
b) $(-3)^4$	$(-3) \times (-3) \times (-3) \times (-3)$	<u>+81</u>

11. Arrange the power in order from the smallest value to the largest value.

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$$(-4)^2, (2)^3, -(4)^3, (-1)^5$$

$$\begin{array}{cccc} \downarrow & \downarrow & \downarrow & \downarrow \\ 16 & 8 & -64 & -1 \end{array}$$

Ans)  $-(-4)^3, (-1)^5, 2^3, (-4)^2$

**Core Skill #3: Core Skills #3: Apply exponent laws: products, quotients and power rules to solve questions.**

12. Simplify, Write in exponential form

a)  $3^2 \times 3^5$

$$3^{2+5}$$

Ans)  $3^7$

b)  $\frac{10^6}{10^2}$

$$10^{6-2}$$

Ans)  $10^4$

c)  $\frac{(-2)^3 \times 2^4}{(-2)^2}$

$$2^{3+4-2}$$

Ans)  $-2^5$

13. Simplify. Write in exponential form

a)  $(4^2)^5$

$$4^{2 \times 5}$$

Ans)  $4^{10}$

b)  $(-9^3 \times 9^2)^4$

*gone*  $[-9^5]^4$  *even*  $= 9^{5 \times 4}$

Ans)  $9^{20}$

14. Simplify and evaluate

$$\left(\frac{-3}{2^2}\right)^3 = \frac{-3^3}{4^3} = \frac{-27}{64}$$

Ans)  $-\frac{27}{64}$

15. Simplify,

$$-[-\{(-3)^3\}^5]^2$$

*destroy*

$$-[-\{3^{15}\}]^2$$

Ans)  $-3^{30}$

16. Solve for "x"

$$\frac{16^{2x}}{4^2} = 2^{3x-1}$$

$$16 = 2^4$$

$$4 = 2^2$$

$$\frac{2^{8x}}{2^4} = 2^{3x-1}$$

$$2^{8x-4} = 2^{3x-1}$$

$$8x-4 = 3x-1$$

$$5x = 3 \implies x = \frac{3}{5}$$

Ans)  $x = \frac{3}{5}$

**Core Skill #4: Understanding orders of operation**

17. Evaluate  $(-2)^2 + (-2)^3$

$$4 - 8$$

Ans)  $-4$

20. Evaluate  $(2-5)^3 + 6 \times 2$

$$(-3)^3 + 12$$

$$-27 + 12$$

Ans)  $-15$

18. Evaluate  $10 - 2^3 \times (3 - 2^0)^2$

$$10 - 32$$

18. Evaluate  $10 - 2^3 \times (3 - 2^0)^2$

$$10 - 8 \times (2)^2$$

$$10 - 8 \times 4$$

Ans) -22

19. Evaluate  $-2(-4^0 - 5^0)$

$$-2(-1 - 1)$$

$$-2 \times (-2)$$

Ans) 4

$$-27 + 12$$

Ans) -15

21. Evaluate  $[(5 - (-2))^2 + (-3)^3]$

$$(5 + 2)^2 - 27$$

$$7^2 - 27$$

$$49 - 27$$

Ans) 22

22. Simplify, then Evaluate

$$\frac{(2)^4(2)^2 - 13 \times 2^0}{(-1 + 2^2)^5}$$

$$\frac{27}{243}$$

$$\frac{2^6 - 13}{(3)^5} = \frac{64 - 13}{243}$$

$$\frac{3 \times 3 \times 3 \times 3 \times 3}{9}$$

Ans)  $\frac{51}{243} = \frac{17}{81}$

23. Simplify, then evaluate

$$[(-2)^3 + (-3)^2] + [(-3)^3 - (-2)^2]^2$$

$$[-8 + 9] + [-27 - 4]^2$$

$$1 + (-31)^2$$

$$1 + 961$$

$$\begin{array}{r} 31 \\ \times 31 \\ \hline 930 \\ 31 \\ \hline 961 \end{array}$$

Ans) 962

24. Add parentheses ( )/{}/[ ] to make the expression true

$$12 \div (4 + 2) \times (3 + 2) = 10$$

$$12 \div 6 \times 5$$

$$\underbrace{12 \div 6}_2 \times 5$$

