

Day 1 Homework: Properties of Exponents

Part 1: Simplify. Your answer should contain only positive exponents.

1) $2m^2 \cdot 2m^3$

2) $m^4 \cdot 2m^{-3}$

3) $4r^{-3} \cdot 2r^2$

4) $4n^4 \cdot 2n^{-3}$

5) $2k^4 \cdot 4k$

6) $2x^3y^{-3} \cdot 2x^{-1}y^3$

7) $2y^2 \cdot 3x$

8) $4v^3 \cdot vu^2$

9) $4a^3b^2 \cdot 3a^{-4}b^{-3}$

10) $x^2y^{-4} \cdot x^3y^2$

11) $(x^2)^0$

12) $(2x^2)^{-4}$

13) $(4r^0)^4$

14) $(4a^3)^2$

15) $(3k^4)^4$

16) $(4xy)^{-1}$

Part 2: Simplify each expression.

1) $(x^{-2}x^{-3})^4$

2) $(x^4)^{-3} \cdot 2x^4$

3) $(n^3)^3 \cdot 2n^{-1}$

4) $(2v)^2 \cdot 2v^2$

5) $\frac{2x^2y^4 \cdot 4x^2y^4 \cdot 3x}{3x^{-3}y^2}$

6) $\frac{2y^3 \cdot 3xy^3}{3x^2y^4}$

7) $\frac{x^3y^3 \cdot x^3}{4x^2}$

8) $\frac{3x^2y^2}{2x^{-1} \cdot 4yx^2}$

9) $\frac{x}{(2x^0)^2}$

10) $\frac{2m^{-4}}{(2m^{-4})^3}$

Simplify each expression.

11) $5x\sqrt{99y^2} + 2y\sqrt{44x^2}$

12) $14xy\sqrt{128x^3} - 17\sqrt{128x^5y^2}$

13) $23\sqrt[3]{48x^3y^3} + 10xy\sqrt[3]{6}$

14) $\sqrt[3]{2000xy^4} - 4y\sqrt[3]{54xy}$

Day 2 Homework

7) $\sqrt[5]{224r^7}$

8) $\sqrt[3]{24m^3}$

9) $\sqrt{392x^2}$

10) $\sqrt{512x^2}$

11) $\sqrt[4]{405x^3y^2}$

12) $\sqrt[3]{-16a^3b^8}$

13) $\sqrt[4]{128x^7y^7}$

14) $\sqrt[3]{16xy}$

15) $\sqrt[6]{448x^7y^7}$

16) $\sqrt[3]{56x^5y}$

I. Find the value of x in each of the following expressions.

$4^x \cdot 4^3 = 4^8$	$(3^x)^{1/4} = 3$	$4^{2/3} \cdot 4^x = 4$
$(3^2)^x = 3^{14}$	$(2^{-3})^x = \frac{1}{2^{12}}$	$\frac{5^{2/3}}{5^x} = 5$
$\frac{4^3}{4^x} = 1$	$\frac{3^x}{3^{12}} = \frac{1}{3^2}$	$5^8 5^x = 1$
$(3^x \cdot 7^5)^4 = 3^{20} 7^y$	$\left(\frac{3^7}{4^x}\right)^{-2} = \frac{4^{10}}{3^y}$	$(5^x 4^3)^2 = 4^y$

Simplify each expression.

$9\sqrt{3} + 2\sqrt{3}$	$5\sqrt{2} + 2\sqrt{3}$	$3\sqrt{7} - 7\sqrt[3]{7}$
$3\sqrt{32} + 2\sqrt{50}$	$\sqrt{200} - \sqrt{72}$	$14\sqrt[3]{xy} - 3\sqrt[3]{xy}$
$4\sqrt[3]{81} - 3\sqrt[3]{72} - 3\sqrt[3]{24}$	$3\sqrt{12} + 7\sqrt{75} - \sqrt{54}$	Simplify $2\sqrt{9x} - 7\sqrt{9x}$ A. $-15\sqrt{x}$ B. $-15x$ C. $-5x$ D. $-5\sqrt{x}$
$5\sqrt{32} - 7\sqrt{8}$	$-7\sqrt{11} + 3\sqrt{11}$	Multiply $\sqrt[3]{25} \cdot \sqrt[3]{5}$. Simplify. A. 25 B. $5\sqrt[3]{5}$ C. $5\sqrt[3]{25}$ D. 5

2) A garden has width $\sqrt{13}$ and length $7\sqrt{13}$. What is the perimeter of the garden in simplest radical form?

Day 3 Homework

Write each expression in radical form.

1) $7^{\frac{1}{2}}$

2) $4^{\frac{4}{3}}$

3) $2^{\frac{5}{3}}$

4) $7^{\frac{4}{3}}$

5) $6^{\frac{3}{2}}$

6) $2^{\frac{1}{6}}$

Write each expression in exponential form.

7) $(\sqrt{10})^3$

8) $\sqrt[6]{2}$

9) $(\sqrt[4]{2})^5$

10) $(\sqrt[4]{5})^5$

11) $\sqrt[3]{2}$

12) $\sqrt[6]{10}$

Write each expression in radical form.

13) $(5x)^{-\frac{5}{4}}$

14) $(5x)^{-\frac{1}{2}}$

15) $(10n)^{\frac{3}{2}}$

16) $a^{\frac{6}{5}}$

Write each expression in exponential form.

19) $(\sqrt[4]{m})^3$

20) $(\sqrt[3]{6x})^4$

21) $\sqrt[4]{v}$

22) $\sqrt{6p}$

Simplify.

25) $9^{\frac{1}{2}}$

26) $343^{-\frac{4}{3}}$

27) $1000000^{\frac{1}{6}}$

28) $36^{\frac{3}{2}}$

29) $(x^6)^{\frac{1}{2}}$

30) $(9n^4)^{\frac{1}{2}}$

Day 4 Homework

Part 1. Solve each equation.

1) $27 = x^{\frac{3}{2}}$

2) $m^{\frac{3}{4}} = 27$

3) $x^{-\frac{3}{2}} = \frac{1}{729}$

4) $7 = r^{\frac{1}{2}}$

5) $v^{\frac{5}{4}} = 243$

6) $n^{\frac{3}{2}} = 125$

Part 2. Solve each equation. Remember to check for extraneous solutions.

1) $\sqrt{110 - n} = n$

2) $p = \sqrt{2 - p}$

3) $\sqrt{30 - x} = x$

4) $x = \sqrt{8x}$

5) $x = \sqrt{42 - x}$

6) $\sqrt{12 - r} = r$

Day 5 Homework- Quiz Review

Simplify. Leave your answer in simplest **radical** form.

1. $\sqrt[3]{x^{16}y^4}$

13. $27^{2/3}$

2. $\sqrt[4]{81x^7y^2}$

14. $216^{-1/3}$

3. $5x^3\sqrt[3]{32x^8}$

15. $\sqrt[6]{25}$

4. $(\sqrt[4]{2x^3})(\sqrt[4]{16x^3})$

16. $\sqrt[6]{125}$

5. $\sqrt[4]{x^{16}y^{18}}$

17. $(\sqrt[3]{x})(\sqrt{x})$

6. $\sqrt[15]{x^5y^{10}}$

18. $(\sqrt[4]{x^3})(\sqrt{3x})$

7. $\sqrt[6]{x^4y^2}$

19. $\sqrt[4]{2x^2}(\sqrt[4]{8x^3} + \sqrt[4]{x})$

8. $\sqrt[3]{54x^7y}$

20. $\sqrt[3]{x}(\sqrt[3]{81x^2} - \sqrt[3]{18x})$

9. $(\sqrt[5]{25x^4})(\sqrt[5]{125x^3})$

21. $(\sqrt[5]{x^3} - 1)(\sqrt[5]{x^3} + 1)$

10. $32^{2/5}$

22. $(\sqrt[3]{2x} + 1)(\sqrt[3]{2x} - 1)$

11. $\left(\frac{16}{625}\right)^{1/4}$

23. $(\sqrt[4]{a^3})(\sqrt[4]{a^3})$

12. $81^{-1/4}$

24. $\sqrt[3]{64x^5y^{10}z^{21}}$

Solve

25. $b = \sqrt{-4 + 4b}$

26. $r = \sqrt{8r}$

27. $\sqrt{-16 + 10a} = a$

28. $r = \sqrt{-1 - 2r}$

29. $5 = \sqrt{r - 3}$

30. $\sqrt{2m - 6} = \sqrt{3m - 14}$

31. $(20 - r)^{\frac{1}{2}} = r$

33. $9 + 5\sqrt[3]{2m} = 29$

32. $(6b)^{\frac{1}{2}} = (8 - 2b)^{\frac{1}{2}}$

34. $-x^{\frac{3}{2}} = -27$

Day 6 Homework

Solving Radical Equations

1.) $4x^{3/2} - 5 = 103$

2.) $\sqrt{x+6} = x$

3.) $(7x-3)^{1/2} = 5$

4.) $\sqrt{x-3} - \sqrt{x} = 3$

5.) $5\sqrt{x+2} = 12$

6.) $\sqrt[3]{2x-4} = -2$

7.) $3(2x+4)^{4/3} = 48$

8.) $\sqrt{4x-8} = 0$

$$9.) \sqrt{7x-6} - \sqrt{5x+2} = 0$$

$$10.) (x-2)^{\frac{2}{3}} - 4 = 5$$

$$11.) \sqrt[3]{2x+1} = \sqrt[3]{8}$$

$$12.) \sqrt{12x+13} = 2x+1$$

$$13.) 2(x+1)^{\frac{3}{2}} = 54$$

$$14.) \sqrt[5]{3-x} + 4 = 3$$

15.) The velocity of a free-falling object is given by $V = \sqrt{2gh}$ where h is the distance in feet the object has fallen and g is acceleration due to gravity in feet per second squared. The value of g depends on your altitude. If an object hits the ground with a velocity of 25 feet per second, from what height was it dropped in each of the following situations?

a.) You are standing on earth, so $g = 32 \text{ ft/s}^2$.

b.) You are on a space shuttle, so $g = 29 \text{ ft/s}^2$.

c.) You are on the moon, so $g = 0.009 \text{ ft/s}^2$.

Day 7 Homework

1 POPULATION

In 1990, Florida's population was about 13 million. Since 1990, the state's population has grown about 1.7% each year. This means that Florida's population is growing exponentially.

Year	Population
1990	
1991	
1992	
1993	
1994	



- Write an explicit function in the form $y = ab^x$ that models the values in the table.
- What does x represent in your function?
- What is the “ a ” value in the equation and what does it represent in this context?
- What is the “ b ” value in the equation and what does it represent in this context?

2 HEALTHCARE

Since 1985, the daily cost of patient care in community hospitals in the United States has increased about 8.1% per year. In 1985, such hospital costs were an average of \$460 per day.

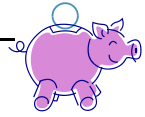
- Write an equation to model the cost of hospital care. Let x = the number of years after 1985.
- Find the approximate cost per day in 2012.
- When was the cost per day \$1000?
- When was the cost per day \$2000?

**3 HALF-LIFE**

To treat some forms of cancer, doctors use Iodine-131 which has a half-life of 8 days. If a patient received 12 millicuries of Iodine-131, how much of the substance will remain in the patient 2 weeks later?

4 SAVINGS

Suppose your parents deposited \$1500 in an account paying 6.5% interest compounded annually when you were born.



- Find the account balance after 18 years.
- When could you expect your account balance to double?
- What would be the difference in the balance after 18 years if the interest rate in the original problem was 8% instead of 6.5%?
- What would be the difference in the balance if the interest was 6.5% and was compounded monthly instead of annually.

5 HEALTH

Since 1980, the number of gallons of whole milk each person in the US drinks in a year has decreased 4.1% each year. In 1980, each person drank an average of 16.5 gallons of whole milk per year.



Year	Gallons
1980	
1981	
1982	
1983	
1984	

- Write a recursive function for the data in the table.
- Write an explicit function in the form $y = ab^x$ that models the values in the table. Define your variables.

- According to this same trend, how many gallons of milk did a person drink in a year in 1970?

6 WASHINGTON, D.C.

The model $y = 604000(0.982)^x$ represents the population in Washington, D.C., x years after 1990.



- How many people were there in 1990?
- What percentage growth or decay does this model imply?
- Write a recursive function to represent the same model as the provided explicit function.
- Suppose the current trend continues, predict the number of people in DC in 2013.
- Suppose the current trend continues, in what year will the population of DC be approximately half what it was in 1990?