

MA 107 INTERMEDIATE ALGEBRA
-A JUST IN TIME APPROACH-
PRACTICE TEST SIX

Sections: 8. 1, 8. 2, 8. 3, 8. 4, 8. 7, 9.1, 9.2, 9.4,



1-6. Simplify the expressions. Leave no negative or zero exponents. [8.1]

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

2) $\left(\frac{3x}{y}\right)^{-2}$

3) $\left(\frac{-5y}{x^3}\right)^2 (3x^2)^{-3} \left(\frac{x}{y}\right)^0$

4) $\frac{-6x^2y^3}{18x^3y^4}$

5) $\frac{8x^{-3}y^{-1}}{6x^2y^{-4}}$

6) $(u^3v^{-2})^{-2}$

7. Change the numbers to powers of 10. [8.2]

a) 0.00007

b) $\frac{1}{1,000,000}$

c) 1 hundredth

8. Convert to scientific notation. [8.2]

- a) 0.00739
- b) 73.9
- c) 8.59
- d) 7,320,000
- e) 0.00000054
- f) $70\bar{0}$

9. Light travels at a rate of about 186,000 miles per second. The average distance from the sun to the earth is 93,000,000 miles. Use scientific notation to find how long it takes light to reach the earth from the sun. [8.2]



10. Compute with the aid of a calculator. Write your answers in standard notation. [8.2]

$$\frac{2.75 \times 10^6 \times 1.5 \times 10^{-2}}{7.5 \times 10^2}$$

Write the expressions in Exercise 11-12 in standard form for scientific notation. Check with a calculator. [8.2]

11. 0.7×10^{-3}

12. $0.07\bar{0} \times 10^{-5}$

13 – 14. Simplify the expressions without a calculator. [8.3]

13. $64^{4/3}$

14. $27^{2/3}$

15. **Finding Present Value** How much should you invest now at 10% compounded quarterly to have \$8,000 toward the purchase of a car in 5 years? [8.3]



16. **Computing Growth Time** How long will it take \$10,000 to grow to \$12,000 if it is invested at 9% compounded monthly? [8.3]



17. Evaluate each of the following. [8.4]

a) $-\sqrt[4]{16}$

b) $\sqrt[3]{-64}$

c) $(-9)^{1/2}$

d) $(\sqrt[4]{81})^3$

e) $(\sqrt[4]{-81})^5$

18. Simplify the following. [8.4]

a) $\sqrt[3]{\frac{xy}{27}}$

b) $\frac{\sqrt[3]{x^4}}{\sqrt[4]{x^3}}$



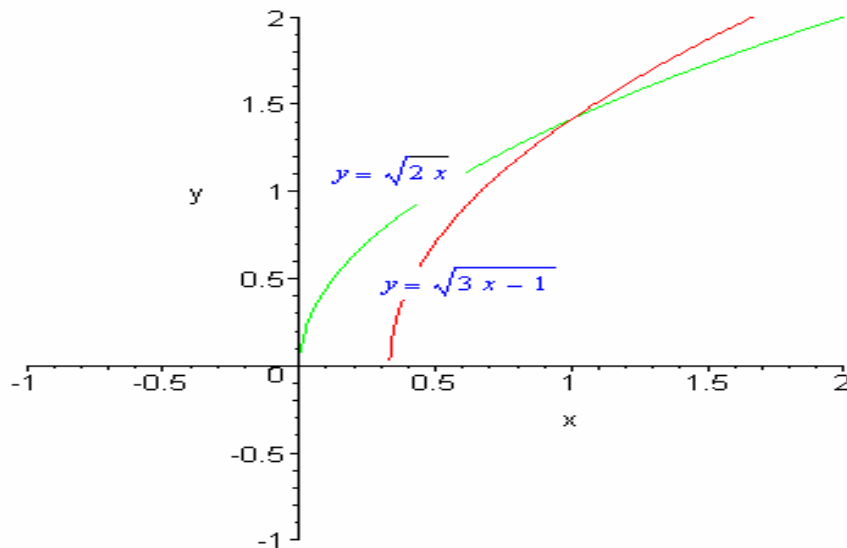
c) $\frac{\sqrt[3]{343}}{\sqrt[3]{64}}$

d) $\sqrt[5]{\sqrt[2]{x^3}}$

e) $\sqrt[3]{81x^5}$



In exercise 19-21, solve with symbols and from the graph in the figure. [8.7]



19. $\sqrt{2x} = \sqrt{3x-1}$

20. $\sqrt{2x} = 2$

21. $-2 = \sqrt{3x-1}$

22. **Depreciation** The following table gives the market value of a minivan (in dollars) x years after its purchase. Find an exponential regression model of the form $y = ab^x$ for this data set. Estimate the value of the van 10 years after its purchase. [9.1, 9.4]

x	Value (\$)
1	12,575
2	9455
3	8115
4	6845
5	5225
6	4485



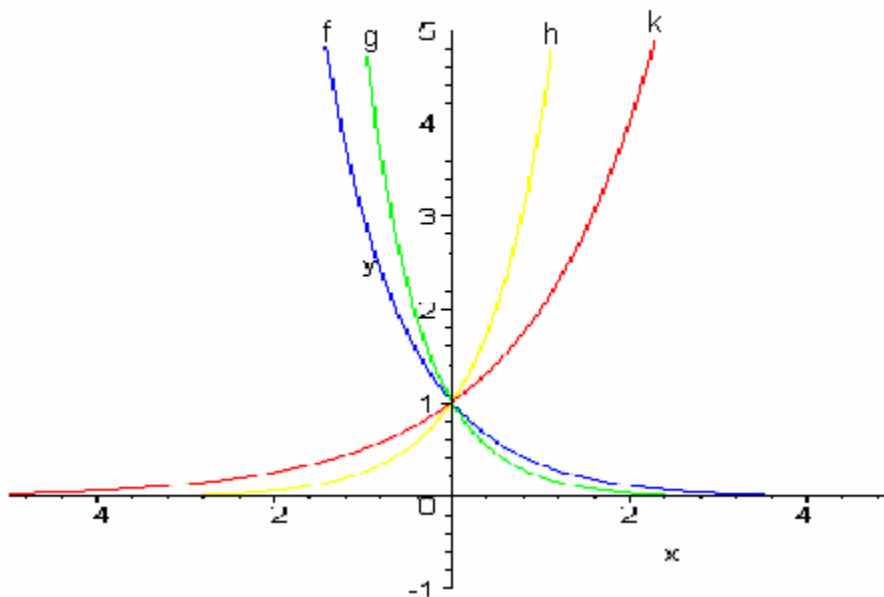
23. Match each equation with the graph of f,g,h, or k in the figure. Do not use a calculator.
[9.2]

(A) $y = 2^x$

(B) $y = 0.2^x$

(C) $y = 4^x$

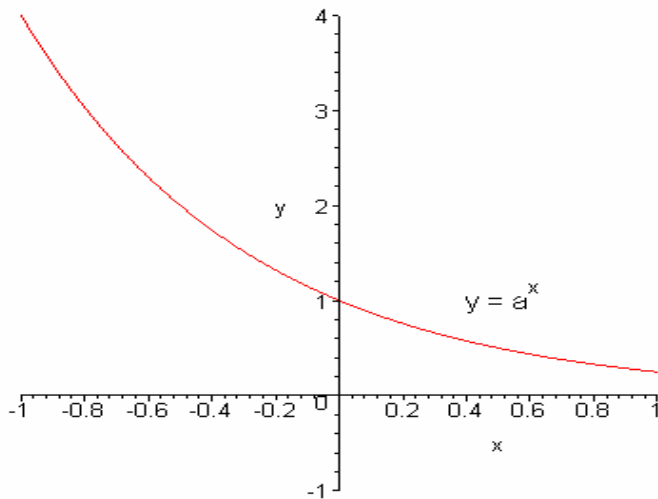
(D) $y = \left(\frac{1}{3}\right)^x$



24. For what set of inputs x is the output to $y = \left(\frac{1}{3}\right)^x$

negative?

25. Refer to the figure below. The base a is not given, so answer the questions from the graph. [9. 2]



- Estimate x for $a^x = 4$
- Estimate x for $a^x = 0.5$
- Estimate y corresponding to a^1
- Estimate y corresponding to a^{-1}
- Estimate the base a

26. **Present Value** A promissory note will pay \$50,000 at maturity rate $5\frac{1}{2}$ years from now. How much should you be willing to pay for the note now if money is worth 8% compounded continuously? [9. 6]

27. Evaluate rounding to three significant digits. [9. 6]

- 5^e
- $\ln(6)$
- π^e

Answers:

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

2) $\frac{y^2}{9x^2}$

3) $\frac{25y^2}{27x^{12}}$

4) $\frac{-1}{3xy}$

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

6) $\frac{v^4}{u^6}$

7a) 7×10^{-5} , b) 10^{-6} , c) 10^{-2}

8a) 7.39×10^{-3} , b) 7.39×10 , c) 8.59×10^0 , d) 7.32×10^6 , e) 5.4×10^{-7} , f) 7.00×10^2

9) $\frac{93,000,000 \text{ mls}}{186,000 \text{ mls}} = 5 \times 10^2 \text{ sec s}$, 10) 0.55×10^2 or 55

11) 7×10^{-4} 12) 7.0×10^{-7} 13) 256 14) 9 15) \$4,882.17 16) About 2 years.

17a) -2 b) -4 c) Not real numbers d) 27 e) Not a real number

18 a) $\frac{\sqrt[3]{xy}}{3}$ b) $x^{7/12}$ c) 7/4 d) $\sqrt[10]{x^3}$ $x \geq 0$ e) $3x\sqrt[3]{3x^2}$

19. {1} 20. {2} 21. \emptyset 22 a) $y = 14910(0.816)^x$ b) $y(10) = 1951.55$ ->Value of the van after 10 years = \$1951.55

23. (A) k (B) g (C) h (D) f 24 \emptyset 25a) $x = -1$ b) $x = 0.5$ c) $y = 0.25$ d) $y = 4$
e) $a = \frac{1}{4}$

26. \$32,201.82 27a) 79.4 b) 1.79 c) 22.5