

# Symbolic Representation Test Review

Directions: Read each question carefully and show all work for full credit.

Fill in the table below...

$$\begin{array}{r} 0.6 \\ 5 \overline{)3.0} \\ \underline{-30} \\ 0 \end{array}$$

$$\begin{array}{r} 0.66\bar{6} \\ 3 \overline{)2.000} \\ \underline{-18} \downarrow \\ 20 \\ \underline{-18} \downarrow \\ 20 \end{array}$$

Fraction	Decimal	Percent
$\frac{3}{5} = \frac{6}{10}$	0.6	60%
$\frac{7}{100}$	0.07	7%
$\frac{54}{100} \left[ \frac{27}{50} \right]$	0.54	54%
$\frac{2}{3}$	$0.\bar{6}$	$66.\bar{6}\%$
$\frac{9}{100}$	0.09	9%
$\frac{649}{1000}$	0.649	64.9%
$\frac{5}{1} = 5$	5.0	500%

Evaluate.

1.  $\sqrt{81} = 9$

2.  $\sqrt{-36}$  NP

3.  $\sqrt[3]{1} = 1$

4.  $\sqrt[3]{8} = 2$

5.  $-\sqrt{16} = -4$

6.  $\sqrt{121} = 11$

7.  $\sqrt[3]{-27} = -3$

8.  $\sqrt[3]{216} = 6$

9.  $-\sqrt{100} = -10$

10.  $\sqrt{9} = 3$

11.  $\sqrt[3]{27} = 3$

12.  $-\sqrt{225} = -15$

13.  $\sqrt{-4}$   
NP

14.  $\sqrt{81} = 9$

15.  $\sqrt[3]{-27} = -3$

16.  $\sqrt[3]{125} = 5$

17.  $\sqrt{400} = 20$

18.  $\sqrt{\frac{4}{16}} = \frac{2}{4} = \left[ \frac{1}{2} \right]$

19.  $\pm\sqrt{\frac{64}{121}} = \frac{8}{11}$  and  $-\frac{8}{11}$

20.  $-\sqrt{\frac{16}{81}} = -\frac{4}{9}$

21.  $\sqrt{5(4+2) - 10 \div 5 + 7 \cdot 3}$

$\sqrt{5(6) - 10 \div 5 + 7 \cdot 3}$

$\sqrt{30 - 2 + 21}$

$\sqrt{28 + 21} = \sqrt{49} = 7$

Estimate each to the nearest tenths place.

23.  $\sqrt[3]{10}$   $\sqrt[4]{16}$

$3$   $4$   
 $3.2$

24.  $\sqrt[2]{3}$   $\sqrt[1]{4}$

$1$   $2$   
 $1.7$

Order the following from least to greatest.

27.  $\sqrt[1]{2}$ ,  $1.5$ ,  $1$ ,  $3$ ,  $\pi$ ,  $\sqrt[2]{8}$ ,  $2$

$1$ ,  $\sqrt{2}$ ,  $1.5$ ,  $2$ ,  $\sqrt{8}$ ,  $3$ ,  $\pi$

22.  $\sqrt{9 \times 6 + 10 \div 5 + 4 \cdot 2}$

$\sqrt{54 + 2 + 8}$

$\sqrt{56 + 8}$

$\sqrt{64} = 8$

25.  $\sqrt[10]{110}$   $\sqrt[11]{121}$

$10$   $11$   
 $10.5$

26.  $\sqrt[8]{72}$   $\sqrt[9]{81}$

$8$   $9$   
 $8.5$

28.  $4.5$ ,  $\sqrt[3]{9}$ ,  $\sqrt[2.4]{6}$ ,  $3$ ,  $\pi$ ,  $\sqrt[4.1]{18}$ ,  $4$

$\sqrt{6}$ ,  $3$  and  $\sqrt[4]{9}$ ,  $\pi$ ,  $4$ ,  $\sqrt{18}$ ,  $4.5$

For each of the following state, "rational" or "irrational" and explain why.

29.  $\pi$

Irrational  $\checkmark$   
it doesn't terminate  
or repeat

30.  $\sqrt{100} = 10$

Rational  $\checkmark$   
it terminates

31.  $\sqrt{18}$

Irrational  $\checkmark$   
It doesn't terminate  
or repeat.

32.  $19.8$

Rational  $\checkmark$   
it terminates

33.  $19$

Rational  $\checkmark$   
it terminates

34.  $-38.9$

Rational  $\checkmark$   
it terminates

35.  $19.168423\dots$

Irrational  $\checkmark$   
it doesn't terminate  
or repeat

36.  $8.16161616\dots$

Rational  $\checkmark$   
it repeats

37.  $9.010010001\dots$

Irrational  $\checkmark$   
it doesn't terminate  
or repeat.

Write each of the following numbers in scientific notation.

38.  $9,260,000,000,000$

$9.26 \times 10^{12}$

39.  $0.000000528$

$5.28 \times 10^{-7}$

40.  $0.00061$

$6.1 \times 10^{-4}$

41.  $8.7E-9$

$8.7 \times 10^{-9}$

42.  $9.24E8$

$9.24 \times 10^8$

43.  $65,000$

$6.5 \times 10^4$

Write each of the following numbers in standard notation.

44.  $7.1 \times 10^9$

$7,100,000,000$

45.  $1.75 \times 10^{-3}$

$0.00175$

46.  $4.813 \times 10^{-7}$

$0.0000004813$

47.  $6.8 \times 10^{-3}$

$0.0068$

48.  $9.432 \times 10^3$

$9432$

49.  $3.1 \times 10^{13}$

$31,000,000,000,000$

Simplify completely. Where necessary, express your answer using only **POSITIVE** exponents.

50.  $a \cdot a \cdot a \cdot b \cdot b \cdot b \cdot b \cdot b \cdot b$

$a^3 b^6$

51.  $a^3 \cdot b^2 \cdot a \cdot b^6$

$a^4 b^8$

52.  $x^7 \cdot y^2 \cdot xy^3$

$x^8 y^5$

53.  $2x^3 \cdot 3x^1$

$6x^4$

54.  $3^2 \cdot 3^1$

$3^3 = 27$

55.  $3^2 \cdot 5^2$

$9 \cdot 25 = 225$

56.  $x^6 \cdot x^7$

$x^{13}$

57.  $x^2 \cdot y^5$

$x^2 y^5$

58.  $\frac{6^5}{6^3} \cdot 6^2$

$6^2 = 6 \cdot 6 = 36$

59.  $\frac{36m^4n^6}{6m^2n}$

$6m^2n^5$

60.  $\frac{4x^4y^3z^5}{40x^9yz^2}$

$\frac{1}{4} \cdot \frac{1}{x^5} \cdot \frac{y^2}{1} \cdot \frac{z^3}{1} = \frac{y^2 z^3}{4x^5}$

61.  $5ab \cdot a^5 \cdot b^2 \cdot c^3$

$5a^6 b^3 c^3$

62.  $3^0$

$= 1$

63.  $k^0$

$= 1$

64.  $5x^2 y^0$

$5x^2$

65.  $a^1$

$= a$

66.  $(2^3)^2$

$2^6 = 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 = 64$

67.  $(x^5)^4$

$x^{20}$

68.  $(x^5 y^5)^2$

$x^{10} y^{10}$

69.  $\left(\frac{1}{x^2}\right)^3$

$\frac{1^3}{x^6} = \frac{1}{x^6}$

Write using only positive exponents.

70.  $x^{-2}$   
 $\frac{1}{x^2}$

71.  $\frac{(a^4 b)}{(a^2 b^8)}$   
 $a^2 b^{-7}$   
 $a^2 \cdot \frac{1}{b^7} = \frac{a^2}{b^7}$

72.  $\frac{(x^4)^4 - 3 = 7}{(x^{-3})}$   
 $x^7$

73.  $\frac{(6 c^{10} d^4)}{(3c^{12} d^{10})}$   
 $2 c^{-2} d^{-6}$   
 $\frac{2}{1} \cdot \frac{1}{c^2} \cdot \frac{1}{d^6} = \frac{2}{c^2 d^6}$

Fill in the box.

74.  $a^{\boxed{3}} \cdot a^5 = a^8$

75.  $n^{\boxed{-5}} = \frac{1}{n^5}$

Write each answer using scientific notation.

46.  $3.2 \times 10^4 + 1.5 \times 10^6$   
 $.032 \times 10^6 + 1.5 \times 10^6$   
 $.032$   
 $+ 1.5$   
 $\boxed{1.532 \times 10^6}$

47.  $8.4 \times 10^4 - 5.4 \times 10^3$   
 $8.4 \times 10^4 - .54 \times 10^4$   
 $8.40$   
 $-.54$   
 $\boxed{7.86 \times 10^4}$

48.  $6.2 \times 10^6 \div 3.1 \times 10^3$   
 $3.1 \overline{) 6.2}$   
 $\boxed{2 \times 10^3}$

49.  $7.4 \times 10^9 \cdot 1.4 \times 10^3$   
 $7.4$   
 $\times 1.4$   
 $\hline 296$   
 $740$   
 $\hline 10.36 \times 10^{12}$   
 $\boxed{1.036 \times 10^{13}}$

Circle the appropriate unit of measure for each of the following...

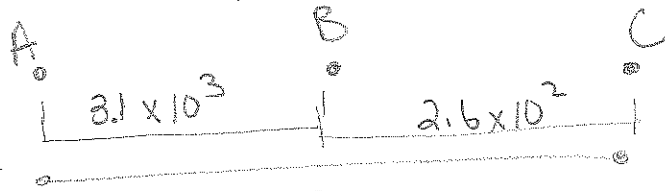
50. The average length of a newborn is 43.2

mm / cm / m.

51. An average weight of a newborn is 3.2

mg / g / kg

2. Three cities lie on a straight line. From west to east the cities are Allentown, Bakersville, and Cooperstown. Allentown is  $3.1 \times 10^3$  miles from Bakersville. Bakersville is  $2.6 \times 10^2$  miles from Cooperstown. If these cities lie on a straight line, how far would it be from Allentown to Cooperstown?

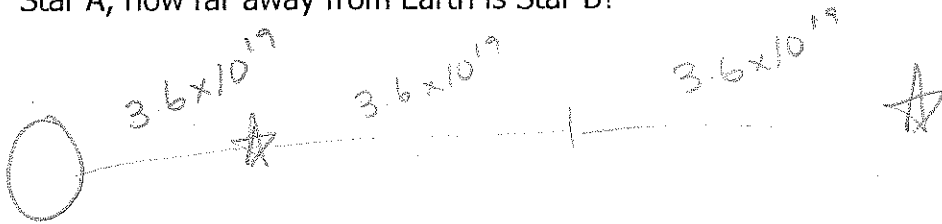


$$3.1 \times 10^3 + 2.6 \times 10^2$$

$$3.1 \times 10^3 + 0.26 \times 10^3$$

$$\begin{array}{r} 3.1 \\ + 0.26 \\ \hline 3.36 \end{array} \times 10^3 \text{ miles}$$

53. Star A is  $3.6 \times 10^{19}$  miles from Earth. If Star B is three times the distance away from Earth as Star A, how far away from Earth is Star B?



$$3.6 \times 10^{19} \times 3$$

$$\begin{array}{r} 3.6 \\ \times 3 \\ \hline 10.8 \end{array} \times 10^{19} \text{ miles}$$