Test Name: 2020-2021 T-Math-Gr7Acc-T4-PBT
Test ID: 2147883
Date:

Section 1 - Students may NOT use a calculator for this test.

Section 1 Instructions
Students may NOT use a calculator for this test.

1.
Which of the following decimals appear to be rational numbers? Choose all that are correct.

A. 41.45454545454545...

B. 75.66666666666666...

C. 7.0625

D. 31.41592653589793...

E. 11.31370849898476...

2.
Can a decimal that has repeating digits after the decimal point be converted into a fraction?

A. Yes, because the decimal is rational, and all rational numbers can be converted to fractions.

B. No, because the decimal is irrational, and no irrational numbers can be converted to fractions.

C. It depends on the number of digits that repeat.

D. It depends on what the digits are that repeat.

3.
Suppose that a number written as a decimal has an infinite number of non–repeating digits after the decimal point. What is this number called?

A. irrational

B. natural

C. rational

D. unnatural

4.
Which fraction is equivalent to $0.0\overline{18}$?

A. $\frac{1}{55}$

B. $\frac{2}{111}$

C. $\frac{9}{500}$

D. $\frac{17}{900}$

5.
A set of numbers is given below.
$\{\sqrt{72},\ 9.25,\ \sqrt{83},\ \pi^2, 8.7\}$
Which list correctly orders the numbers from least to greatest?

A. $8.7, 9.25, \pi^2, \sqrt{72}, \sqrt{83}$

B. $\sqrt{72}, 8.7, \sqrt{83}, 9.25, \pi^2$

C. $\pi^2, 9.25, \sqrt{83}, 8.7, \sqrt{72}$

D. $\sqrt{72}\sqrt{83}, 8.7, 9.25, \pi^2$

6.
Which of the following irrational expressions are located between 6 and 8 on the number line? Select *three* that apply.

A.
$2\sqrt{15}$

B.
$\sqrt{7} + 4$

C.
$8 - \sqrt{5}$

D.
$\sqrt{23} + \sqrt{8}$

E.
$\sqrt{80} - 3$

7.
Which of the following numbers is between 5 and 10 on a number line? Select two that apply.

A.
$\sqrt{6}$

B.
$-\sqrt{8}$

C.
$\sqrt{21}$

D.
$\sqrt{38}$

E.
$\sqrt{44}$

F.
$-\sqrt{59}$

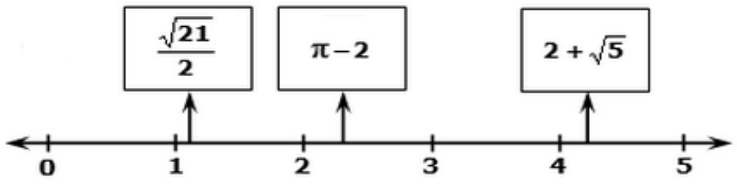
8.
Three irrational numbers are given below. Select the option that correctly plots the approximate value of each number on the number line.

$2+\sqrt{5}$

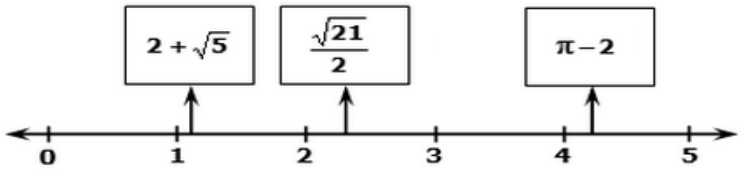
$\pi-2$

$\frac{\sqrt{21}}{2}$

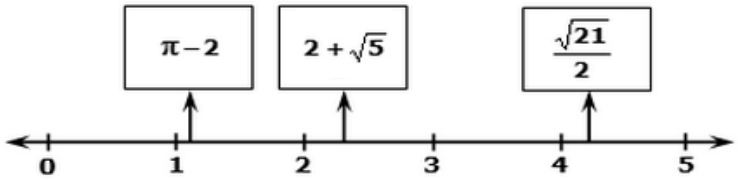
A.



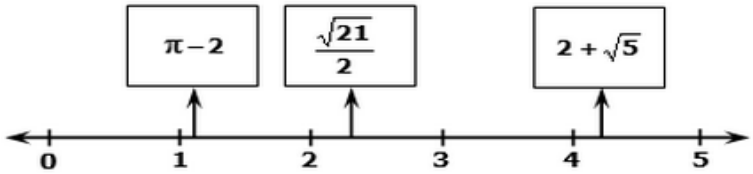
B.



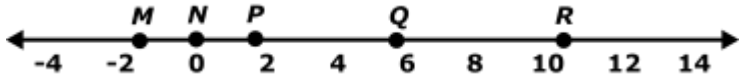
C.



D.



9.
Where would $\sqrt{7}$ be located on the number line below?



A. between M and N

B. between N and P

C. between P and Q

D. between Q and R

10.
Simplify:

$3(8)^0 \bullet (3)^{-2}$

A. $\frac{24}{9}$

B. –27

C. $\frac{1}{3}$

D. –216

11.

Which of these is equivalent to $\frac{(2^{-4})^2 \times 2^{-5}}{2^{-6}}$?

A. 2^{-19}

B. $\frac{1}{2^7}$

C. $\frac{1}{2}$

D. 2^3

12.

Which of these equations is correct? Select *three* that apply.

A. $2^{-2} \times 2^8 = 64$

B. $3^{-5} \times 3^1 = \frac{1}{81}$

C. $4^4 \times 4^{-3} = 4$

D. $5^3 \times 5^{-1} = \frac{1}{125}$

E. $6^{-8} \times 6^6 = 36$

F. $8^2 \times 8^{-4} = \frac{1}{16}$

13.

What is the value of $\frac{6^7 \cdot 4^4 \cdot 2}{6^5 \cdot 4^4 \cdot 2^2}$?

A. $\frac{1}{18}$

B. $\frac{4}{2}$

C. $\frac{36}{4}$

D. 18

14.

The radius of the Sun is about 700,000,000 meters, the radius of the planet Venus is about 6,000,000 meters, and the radius of the supergiant star Betelgeuse is about 500,000,000,000 meters. Which of these statements is correct? Select all that apply.

A. The radius of the Sun is about 7×10^7 meters, and the radius of Venus is about 6×10^6 meters.

B. The radius of the Sun is about 7×10^8 meters, and the radius of Betelgeuse is about 5×10^{11} meters.

C. The radius of Venus is about 6×10^6 meters, and the radius of the Sun is about 7×10^8 meters.

D. The radius of Venus is about 6×10^7 meters, and the radius of Betelgeuse is about 5×10^{11} meters.

E. The radius of Betelgeuse is about 5×10^{10} meters, and the radius of the Sun is about 7×10^8 meters.

F. The radius of Betelgeuse is about 5×10^{11} meters, and the radius of Venus is about 6×10^6 meters.

15.
A computer magazine is analyzing three microprocessors. Microprocessor A executes one cycle in 0.00000000003 seconds, microprocessor B executes one cycle in 0.0000002 seconds, and microprocessor C executes one cycle in 0.000000008 seconds. Which of these statements is correct? Select *all* that apply.

A. Microprocessor A executes one cycle in 3×10^{-11} seconds, and microprocessor B executes one cycle in 2×10^{-7} seconds.

B. Microprocessor A executes one cycle in 3×10^{-11} seconds, and microprocessor C executes one cycle in 8×10^{-8} seconds.

C. Microprocessor B executes one cycle in 2×10^{-7} seconds, and microprocessor A executes one cycle in 3×10^{-12} seconds.

D. Microprocessor B executes one cycle in 2×10^{-7} seconds, and microprocessor C executes one cycle in 8×10^{-9} seconds.

E. Microprocessor C executes one cycle in 8×10^{-9} seconds, and microprocessor A executes one cycle in 3×10^{-11} seconds.

F. Microprocessor C executes one cycle in 8×10^{-9} seconds, and microprocessor B executes one cycle in 2×10^{-6} seconds.

16.
Dinosaurs have been extinct for about 6.5×10^{7} years, while Neanderthals have been extinct for about 3.0×10^{4} years. About how many times longer have dinosaurs been extinct than Neanderthals?

A. 1000 times longer

B. 2000 times longer

C. 10,000 times longer

D. 20,000 times longer

17.
There are about 3×10^{20} gallons of salt water on the earth, while there are about 6×10^{18} gallons of fresh water. About how many times the amount of fresh water is the amount of salt water?

A. 2 times the amount

B. 50 times the amount

C. 200 times the amount

D. 500 times the amount

18.
Aisha, Silvio, and Jim, each solved the same equation. Aisha's answer was $x = 4$, Silvio's answer was $x = 8$, and Jim's answer was $x = 16$. If either Aisha or Jim, but not Silvio, is correct, which of these equations could it be? Select *all* that apply.

A. $x^2 = 4$

B. $x^2 = 16$

C. $x^2 = 64$

D. $x^2 = 256$

E. $x^3 = 8$

F. $x^3 = 64$

19.
Which of these statements is true about $\sqrt{2}$?

A. It is irrational, because it can be written as a fraction with an integer in the numerator and the denominator.

B. It is irrational, because it cannot be written as a fraction with an integer in the numerator and the denominator.

C. It is rational, because it can be written as a fraction with an integer in the numerator and the denominator.

D. It is rational, because it cannot be written as a fraction with an integer in the numerator and the denominator.

20.
What is $x^3 = \frac{8}{27}$?

A. $\frac{2}{3}$

B. $\sqrt[3]{\frac{2}{3}}$

C. $\sqrt[3]{\frac{3}{2}}$

D. $\frac{3}{2}$

21.
Which of these is a solution to the equation $x^3 = 36$, $x^2 = 42$, or $x^3 = 55$? Select *three* that apply.

A.
$x = \sqrt{36}$

B.
$x = \sqrt{42}$

C.
$x = \sqrt{55}$

D.
$x = \sqrt[3]{36}$

E.
$x = \sqrt[3]{42}$

F.
$x = \sqrt[3]{55}$

22.
Which of these equations are correct? Select *all* that apply.

A. $(4.6 \times 10^5) - (2.1 \times 10^4) = 250{,}000$

B. $(8.8 \times 10^8) - (6.2 \times 10^7) = 818{,}000{,}000$

C. $(9.9 \times 10^7) - (5.8 \times 10^6) = 9{,}320{,}000$

D. $(7.3 \times 10^6) - (4.2 \times 10^5) = 6{,}880{,}000$

E. $(2.9 \times 10^8) - (1.3 \times 10^7) = 16{,}000{,}000$

F. $(3.6 \times 10^5) - (1.1 \times 10^4) = 349{,}000$

23.
The area of the Pacific Ocean is 63,780,000 square miles. The Atlantic Ocean is 2.27 x 10^7 square miles smaller than the Pacific Ocean. What is the area of the Atlantic Ocean written in scientific notation?

A. 4.108×10^7

B. 6.151×10^7

C. 6.378×10^7

D. 8.648×10^7

24. What is the product of $(8.8 \times 10^6)\ (5 \times 10^2)$?

A. 4.4×10^8

B. 4.4×10^9

C. 4.4×10^{12}

D. 4.4×10^{10}

25.
An atom of silicon is approximately 0.00000000025 meters wide. How do you express that number in scientific notation?

A. 2.5×10^{10} meters

B. 25×10^{-10} meters

C. 2.5×10^{-10} meters

D. 2.5×10^{-11} meters

You have reached the end of this section.

Grade 7 FSA Mathematics Reference Sheet

Customary Conversions

1 foot = 12 inches
1 yard = 3 feet
1 mile = 5,280 feet
1 mile = 1,760 yards

1 cup = 8 fluid ounces
1 pint = 2 cups
1 quart = 2 pints
1 gallon = 4 quarts

1 pound = 16 ounces
1 ton = 2,000 pounds

Metric Conversions

1 meter = 100 centimeters
1 meter = 1000 millimeters
1 kilometer = 1000 meters

1 liter = 1000 milliliters

1 gram = 1000 milligrams
1 kilogram = 1000 grams

Time Conversions

1 minute = 60 seconds
1 hour = 60 minutes
1 day = 24 hours
1 year = 365 days
1 year = 52 weeks

Formulas

$A = bh$

$A = lw$

$A = \frac{1}{2}bh$

$A = \frac{1}{2}h(b_1 + b_2)$

$V = Bh$

$V = \frac{1}{3}Bh$

$SA = Ph + 2B$

$SA = \frac{1}{2}P\ell + B$

Grade 8 FSA Mathematics Reference Sheet

Customary Conversions

1 foot = 12 inches
1 yard = 3 feet
1 mile = 5,280 feet
1 mile = 1,760 yards

1 cup = 8 fluid ounces
1 pint = 2 cups
1 quart = 2 pints
1 gallon = 4 quarts

1 pound = 16 ounces
1 ton = 2,000 pounds

Metric Conversions

1 meter = 100 centimeters
1 meter = 1000 millimeters
1 kilometer = 1000 meters

1 liter = 1000 milliliters

1 gram = 1000 milligrams
1 kilogram = 1000 grams

Time Conversions

1 minute = 60 seconds
1 hour = 60 minutes
1 day = 24 hours
1 year = 365 days
1 year = 52 weeks