

Lesson 1-3: Exploring Real Numbers

Part 1: Classifying Numbers

- 080208a, P.I. 7.N.17
The number 0.14114111411114 . . . is
[A] irrational [B] integral
[C] rational [D] whole
- 010632a, P.I. 7.N.2
Write an irrational number and explain why it is irrational.
- 069923a, P.I. 7.N.2
Which number below is irrational?
 $\sqrt{\frac{4}{9}}$, $\sqrt{20}$, $\sqrt{121}$
Why is the number you chose an irrational number?
- 010416a, P.I. 7.N.2
Which number is irrational?
[A] $\frac{2}{3}$ [B] $\sqrt{8}$ [C] 0.3333 [D] $\sqrt{9}$
- 060303a, P.I. 7.N.2
Which expression represents an irrational number?
[A] 0 [B] $\sqrt{2}$ [C] 0.17 [D] $\frac{1}{2}$
- 010219a, P.I. 7.N.2
Which is an irrational number?
[A] $\frac{3}{4}$ [B] $\sqrt{3}$ [C] $\sqrt{9}$ [D] 3.14
- 060211a, P.I. 7.N.2
Which is an irrational number?
[A] 0 [B] $\sqrt{9}$ [C] π [D] $-\frac{1}{3}$

- 080523a, P.I. 7.N.2
Which is an irrational number?
[A] π [B] $0.\bar{3}$ [C] $\sqrt{49}$ [D] $\frac{3}{8}$
- 080718a, P.I. 7.N.2
Which number is irrational?
[A] $0.\bar{3}$ [B] $\frac{5}{4}$ [C] $\sqrt{121}$ [D] π
- 080432a, P.I. 7.N.2
Given: $\frac{\sqrt{99}}{11}$, $\sqrt{164}$, $\sqrt{196}$
Identify the expression that is a rational number and explain why it is rational.
- 060003a, P.I. 7.N.2
Which number is rational?
[A] $\sqrt{\frac{3}{2}}$ [B] π [C] $\sqrt{7}$ [D] $\frac{5}{4}$
- 060120a, P.I. 7.N.2
Which is a rational number?
[A] $5\sqrt{9}$ [B] $6\sqrt{2}$ [C] π [D] $\sqrt{8}$
- 080102a, P.I. 7.N.2
Which expression is rational?
[A] $\sqrt{\frac{1}{4}}$ [B] $\sqrt{3}$ [C] $\sqrt{\frac{1}{2}}$ [D] π

Part 2: Comparing Numbers

- 060433a, P.I. 7.N.3
Kyoko's mathematics teacher gave her the accompanying cards and asked her to arrange the cards in order from least to greatest. In what order should Kyoko arrange the cards?

π	$\sqrt{8}$	$3.\bar{1}$	$2\sqrt{3}$	$2\frac{4}{5}$
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15. 010304a, P.I. 7.N.3

In which list are the numbers in order from least to greatest?

[A] $\sqrt{3}$, 3.2, π , $3\frac{1}{3}$ [B] 3.2, π , $3\frac{1}{3}$, $\sqrt{3}$

[C] 3.2, $3\frac{1}{3}$, $\sqrt{3}$, π [D] $\sqrt{3}$, π , 3.2, $3\frac{1}{3}$

16. 080516a, P.I. 7.N.3

Which numbers are arranged from smallest to largest?

[A] $\sqrt{9.1}$, 3.14, π , $\frac{22}{7}$

[B] 3.14, $\frac{22}{7}$, π , $\sqrt{9.1}$

[C] $\sqrt{9.1}$, 3.14, $\frac{22}{7}$, π

[D] $\sqrt{9.1}$, π , 3.14, $\frac{22}{7}$

17. 060609a, P.I. 7.N.3

Which list is in order from smallest value to largest value?

[A] π , $\frac{22}{7}$, 3.1, $\sqrt{10}$ [B] 3.1, π , $\frac{22}{7}$, $\sqrt{10}$

[C] 3.1, $\frac{22}{7}$, π , $\sqrt{10}$ [D] $\sqrt{10}$, $\frac{22}{7}$, π , 3.1

18. 080621a, P.I. 7.N.3

Which list shows the numbers

$|-0.12|$, $\sqrt{\frac{1}{82}}$, $\frac{1}{8}$, $\frac{1}{9}$ in order from smallest to largest?

[A] $\sqrt{\frac{1}{82}}$, $|-0.12|$, $\frac{1}{9}$, $\frac{1}{8}$

[B] $\sqrt{\frac{1}{82}}$, $\frac{1}{9}$, $|-0.12|$, $\frac{1}{8}$

[C] $|-0.12|$, $\frac{1}{8}$, $\frac{1}{9}$, $\sqrt{\frac{1}{82}}$

[D] $\frac{1}{8}$, $\frac{1}{9}$, $\sqrt{\frac{1}{82}}$, $|-0.12|$

19. 010526a, P.I. 7.N.3

Which expression has the *smallest* value?

[A] -3.02 [B] $-\sqrt{10}$

[C] $-\pi$ [D] $-\frac{16}{5}$

20. 010002a, P.I. 7.N.3

Which number has the greatest value?

[A] $\frac{\pi}{2}$ [B] $\sqrt{2}$ [C] $1\frac{2}{3}$ [D] 1.5

21. 010213a, P.I. 7.N.3

Which inequality is true if $x = \frac{3.04}{1.48}$, $y = 1.99 + 0.33$, and $z = (1.3)^3$?

[A] $x < z < y$ [B] $x < y < z$

[C] $y < x < z$ [D] $y < z < x$

22. 080717a, P.I. 7.N.3

If $t < \sqrt{t}$, t could be

[A] 4 [B] 0 [C] $\frac{1}{2}$ [D] 2

23. 069917a, P.I. 7.N.3

If $t^2 < t < \sqrt{t}$, then t could be

- [A] $\frac{1}{4}$ [B] 0 [C] $-\frac{1}{4}$ [D] 4

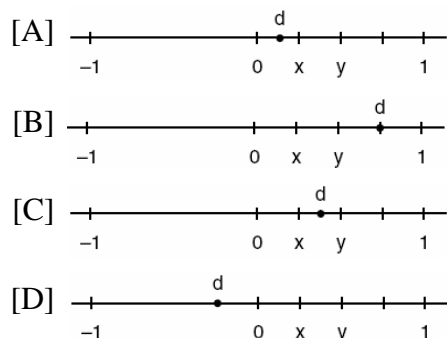
24. 010512a, P.I. 7.N.3

If $x^3 < x < \frac{1}{x}$, then x could be equal to

- [A] $\frac{1}{5}$ [B] 1 [C] $\frac{6}{5}$ [D] 5

25. 010120a, P.I. 7.N.3

Let x and y be numbers such that $0 < x < y < 1$, and let $d = x - y$. Which graph could represent the location of d on the number line?



26. 080006a, P.I. 7.N.3

If $a < b$, $c < d$, and a , b , c , and d are all greater than 0, which expression is always true?

- [A] $a + c > b + d$ [B] $\frac{a}{d} > \frac{b}{c}$
[C] $ac < bd$ [D] $a - c + b - d = 0$

27. 010816a, P.I. 7.N.3

In which group are the numbers arranged in order from smallest value to largest value?

- [A] 3.14, $\sqrt{9.86}$, π , $\frac{22}{7}$
[B] $\sqrt{9.86}$, $\frac{22}{7}$, 3.14, π
[C] π , 3.14, $\sqrt{9.86}$, $\frac{22}{7}$
[D] $\frac{22}{7}$, 3.14, π , $\sqrt{9.86}$

28. 010518a, P.I. A.N.6

The expression $-|-7|$ is equivalent to

- [A] 7 [B] -7 [C] 0 [D] 1

29. 060522a, P.I. A.N.6

If $r = 2$ and $s = -7$, what is the value of $|r| - |s|$?

- [A] -9 [B] 5 [C] 9 [D] -5

[1] A

[2] An irrational number is written, and an appropriate explanation is written, such as an irrational number cannot be written as a fraction or as a repeating or terminating decimal.

[1] An irrational number is written, such as π or the square root of a nonperfect square, but no explanation or an inappropriate explanation is written.

or [1] A correct definition of an irrational number is written, but the example is missing or is inappropriate.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously

[2] incorrect procedure.

[2] $\sqrt{20}$ and an appropriate explanation is given, such as the number cannot be written as a repeating or terminating decimal or it cannot be written as a fraction or it is not a perfect square.

[1] $\sqrt{20}$ and an inappropriate explanation or no explanation is given.

or [1] $\sqrt{20}$ and a correct explanation is given, but one other number is also identified as irrational.

[0] All three numbers are identified as irrational.

or [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an

[3] obviously incorrect procedure.

[4] B

[5] B

[6] B

[7] C

[8] A

[9] D

[2] $\sqrt{196}$, and an appropriate explanation is given.

[1] An incorrect answer is chosen, but an appropriate explanation is given.

or [1] $\sqrt{196}$, but no explanation or an incorrect explanation is given.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously

[10] incorrect procedure.

[11] D

[12] A

[13] A

[2] $2\frac{4}{5}$, $\sqrt{8}$, $3.\bar{1}$, π , $2\sqrt{3}$ and appropriate

work is shown, such as converting each value to a decimal equivalent.

[1] All values are correctly converted to decimal equivalents, but the order is not indicated or is indicated incorrectly.

or [1] One or two computational errors are made in finding decimal equivalents, but the appropriate order is indicated.

or [1] Appropriate work is shown, but one conceptual error is made, such as indicating the order from greatest to least.

or [1] $2\frac{4}{5}$, $\sqrt{8}$, $3.\bar{1}$, π , $2\sqrt{3}$, but no work is shown.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously

[14] incorrect procedure.

[15] D

[16] A

[17] B

[18] B

[19] D

[20] C

[21] A

[22] C

[23] A

[24] A

[25] D

[26] C

[27] A

[28] B

[29] D