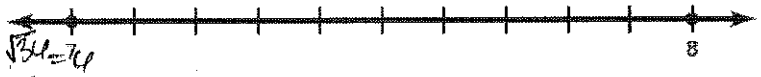
1-3 Box 4.

Rational and Irrational Numbers
8.NS.1 and 8.NS.2

Mastery Assessment

1. Which value could be represented by a point between the labeled numbers on the number line below?



~~A~~ $\sqrt{48}$ $\sqrt{36}=6$ $\sqrt{49}=7$

~~B~~ $\frac{39}{6}$ → 6.5 too small; $6\overline{)39.0}$ -36 30

C $\sqrt{56}$ $\sqrt{49}=7$ $\sqrt{64}=8$

~~D~~ $\frac{74}{9}$ → $9\overline{)74.0}$ 72 20 too big

2. Four numbers are shown below.

2^3, 7.5, $\sqrt{70}$, $2\sqrt{10}$ → $\sqrt{10} \approx 3.1 \times 2 = 6.2$

$\sqrt{64}=8$ $\sqrt{81}=9$ $\sqrt{72}\approx 8.5$

Which list shows these numbers in order, from greatest to least value?

A $\sqrt{70}$, 2^3, 7.5, $2\sqrt{10}$

B $\sqrt{70}$, $2\sqrt{10}$, 2^3, 7.5

~~C~~ $2\sqrt{70}$, 7.5, 2^3, $\sqrt{70}$

~~D~~ $2\sqrt{70}$, $\sqrt{70}$, 2^3, 7.5

3. Which statement is true?

A The number $\frac{9}{10}$ is irrational. False - fraction

B The number $(\sqrt{2})^2$ is rational. $= 2$ ✓

C The number $\sqrt{44}$ is rational. False - not a perfect square

D The number $\frac{6}{15}$ is irrational. $= \frac{6}{15}$ False - fraction

4. Four numbers are shown below.

$3.9, \frac{31}{7}, \sqrt{15}, \frac{15}{4}$ $= 4.5151\ldots$ $= 3.9151\ldots$ $= 3.75$

$4\overline{)15.0}$ -12 30 → 3.7

Which list shows these numbers in order, from least to greatest value?

A $\frac{15}{4}, \frac{31}{7}, 3.9, \sqrt{15}$

B $\frac{31}{7}, 3.9, \sqrt{15}, \frac{15}{4}$

C $\sqrt{15}, \frac{15}{4}, 3.9, \frac{31}{7}$

D $\frac{15}{4}, \sqrt{15}, 3.9, \frac{31}{7}$

5. Which number is rational?

A ~~$\frac{\sqrt{\pi}}{4}$~~

B $\sqrt{18}$ not a perfect square

C 2.121121112... doesn't repeat

D $\frac{\sqrt{44}}{\sqrt{99}} = \sqrt{\frac{4}{9}} = \frac{2}{3}$ ✓

6. Which number has the greatest value?

A 8.5

B $3\sqrt{8}$ $\sqrt{8} \approx 2.8$, $2.8 \times 3 = 8.4$

C $\frac{15}{2} = 7.5$

D $1^9 = 1$

7. Which number is an irrational number?

A 8.23 terminating decimal

B $\frac{\sqrt{56}}{2}$ ← irrational

C $\frac{\sqrt{144}}{6} = \frac{12}{6} = 2$

D 0.0079 ends

Look at the list of values.

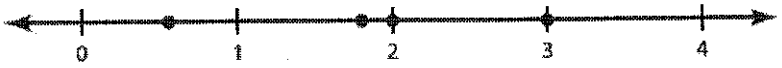
$\frac{5}{9}$, $\frac{9}{5}$, $\sqrt{5}$, and $\frac{13.5}{4.5} = 3$

≈ 0.6, ≈ 1.8, ≈ 2.3

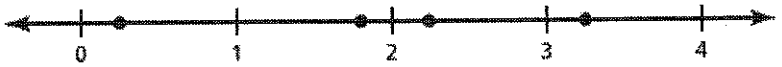
$45\overline{)135}$ 3, -135, 0

Which number line has all four values plotted correctly?

A



B



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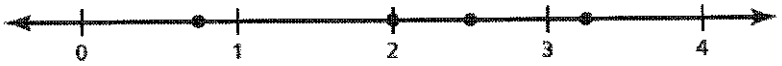

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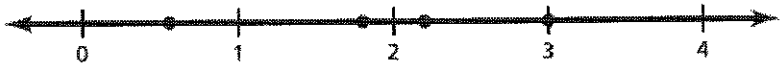
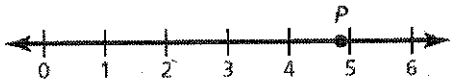


9. Which real number is closest in value to the number represented by Point *P* on the number line?



A $\sqrt{18} \approx 4.3$

B $\sqrt{24} \approx 4.9$

C $\frac{23}{5} = 4.6$

~~D~~ 4.5999

10. Which number is irrational?

~~A~~ 2.001678 ends

B 1.02002000200002 . . . no repetition

C 0.245245245 . . . repeats same #s

~~D~~ 0.2 ends

11. Which statement is true?

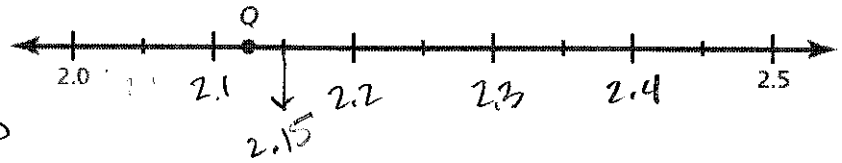
A The number $\frac{5}{8}$ is rational. ✓

~~B~~ The number $\sqrt{\pi}$ is rational. π is irrational

~~C~~ The number $\frac{\sqrt{5}}{\sqrt{20}}$ is irrational. $\sqrt{\frac{5}{20}} = \sqrt{\frac{1}{4}} = \frac{1}{2}$

~~D~~ The number 0.625 is irrational. ends

12. Which value is best represented by Point Q in the number line below?



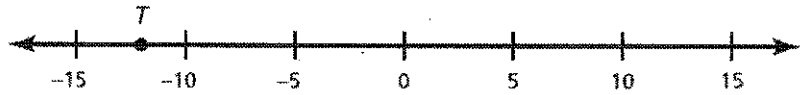
A 2.125

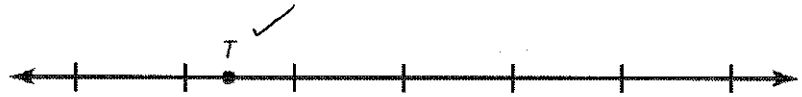
B 2.15

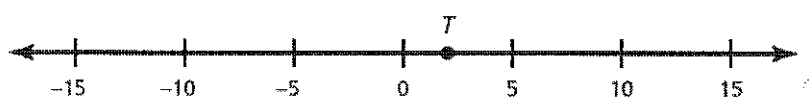
C 2.225

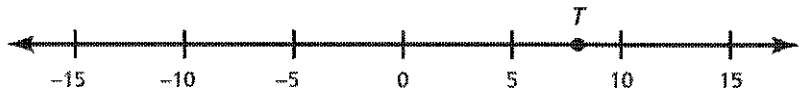
D 2.25

13. On Tuesday, the low temperature in a city was −8°F. On which number line does Point T best represent −8?

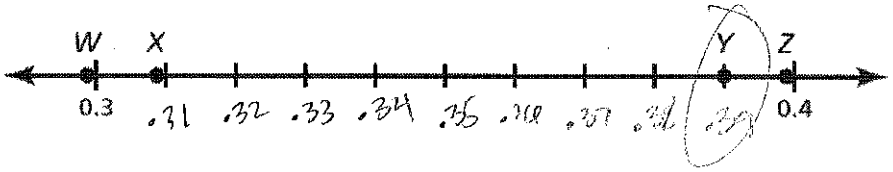
A


B


C


D


14. Which point on the number line below best represents 0.39?



A Point W

B Point X

C Point Y

D Point Z

15. Which number is a rational number?

A 1

B

C $\sqrt{6}$ not a perfect square

D 0.832141141114... doesn't end or repeat

16. Look at this list of values.

$$\left\{-1,\ \sqrt{8},\ \frac{3}{8},\ -0.212\right\}$$

Which statement about these values is true?

~~A~~ Only -1 is irrational. it's rational

~~B~~ Only -0.212 is rational. -1 and $\frac{3}{8}$ are rational

~~C~~ $\sqrt{8}$ and $\frac{3}{8}$ are irrational. $\frac{3}{8}$ isn't

D -1, $\frac{3}{8}$ and -0.212 are rational.

17. Estimate the closest square root of 73.

A About 8.5
~~**B**~~ About 8.0
~~**C**~~ About 7.5
~~**D**~~ About 7.0

$\sqrt{73}$ between $\sqrt{64}$ (8) and $\sqrt{81}$ (9)

18. Which one of the following is a perfect square?

A 324 $\sqrt{324} = 18$
~~**B**~~ 75 $\sqrt{75}$ I
~~**C**~~ 205 $\sqrt{205}$ I
~~**D**~~ 99 $\sqrt{99}$ I

1-3 Box 5

[Type text] **Station 2 – Rational and Irrational Numbers** [Type text]

Directions: Solve the following questions.

1 .Identify the numbers below as **rational** or **irrational**. Explain for each answer.

a. 0.161616... R - repeats
b. ¾ R - fraction
c. $\sqrt{115}$ I - not a perfect square
d. 2.345... I - doesn't end
e. -3.24 R - ends

2. Which set of numbers below does NOT contain an irrational number?

a. $-\sqrt{5}$, $-\sqrt{195}$, -8.15 (I, I)
b. $-\sqrt{49}$, $\sqrt{144}$, 6.6 ✓
c. -0.6868..., $-2\,{}^{3}/_{8}$, $\sqrt{10}$ (I)
d. ${}^{5}/_{6}$, -1, $\sqrt{11}$ (I)

3. Which of the following sets of numbers contains no rational numbers?

a. -3.5041..., $\sqrt{99}$, 0.143635...
b. π, ½, -13 (R)
c. -6, $-\sqrt{225}$, $4\,{}^{7}/_{8}$ (R)
d. $\sqrt{21}$, 0.75, 0 (R)

4. Order the following numbers from least to greatest:

4.5, $\sqrt{4}$, - ½ , -3.4, 0.8

$-3.4, -\frac{1}{2}, 0.8, \sqrt{4}, 4.5$

5. Compare the following numbers using <, >, or =

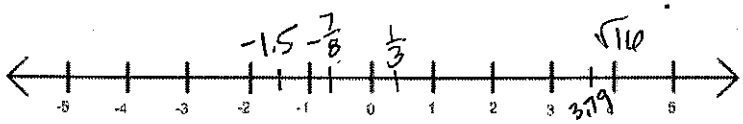
a. ${}^{4}/_{5}$ > ${}^{2}/_{6}=\frac{1}{3}$
b. -2.3 < -1.4
c. $\sqrt{19} \approx 4.4$ > 4
d. ${}^{13}/_{15}$ < .89

$$15\overline{)13.00} = 0.86\overline{6}$$
120
100
90

6. Place the following numbers on the number line below:

$\sqrt{16}$, $-{}^{7}/_{8}$, 3.79, -1.5, ${}^{1}/_{3}$

(4)



Station 6

1-3 Box 6

1. Write $0.\overline{3}$ as a simplified equivalent fraction.

$\frac{3}{9} = \boxed{\frac{1}{3}}$

2. Write $0.\overline{11}$ as a simplified equivalent fraction.

$\frac{11}{99} = \boxed{\frac{1}{9}}$

3. Which whole number is closest to $\sqrt{355}$?

$\sqrt{324}$ $\quad$ $\sqrt{361}$

18 $\quad$ 19

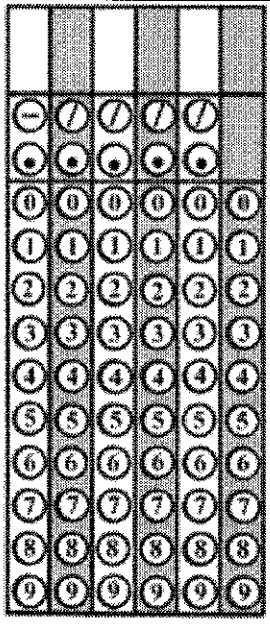
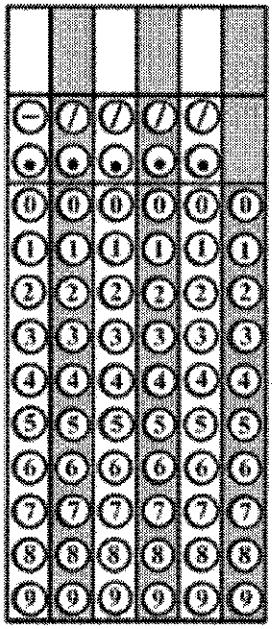
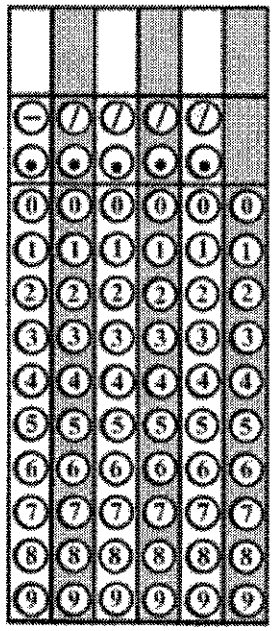
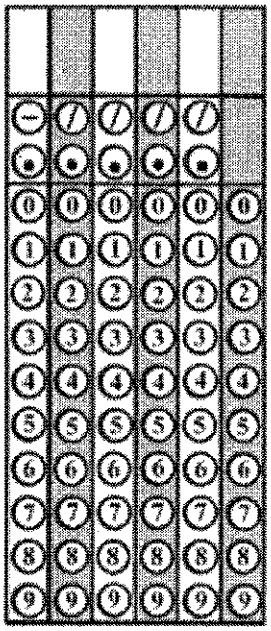
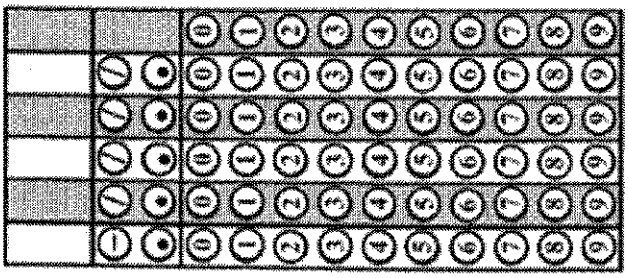
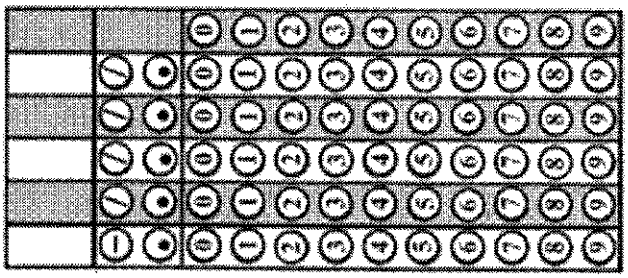
$\boxed{19}$

4. Write $0.\overline{72}$ as a simplified equivalent fraction.

$\frac{72 \div 9}{99 \div 9} = \boxed{\frac{8}{11}}$

5. Simplify: $\frac{5^3 \cdot 5^6}{5^{10}}$

6. Solve: $8 - 3x = 5(4 - x)$

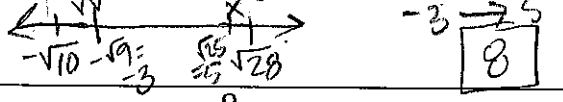
Station 6

7. The area of a square is 144 cm² what is the perimeter of the same square?

$\sqrt{144} = 12 \times 4 = 48$ cm

8. In ΔDEF, two angles each measure 35°. What is the measure of the third angle?

9. Point ***w*** is located at the smallest integer that is larger than $-\sqrt{10}$ and point ***x*** is the point that is located at the largest integer that is smaller than $\sqrt{28}$. What is the distance between point ***w*** and point ***x***?



$-3 \to 5$

8

10. Simplify: $\frac{11}{14} \cdot 0.\overline{28}$

$\frac{11}{14} \cdot \frac{28}{99} = \frac{2}{9}$

11. Simplify: $\frac{9}{5} \cdot 0.\overline{1}$

$\frac{9}{5} \cdot \frac{1}{9} = \frac{9}{45} = \frac{1}{5}$

12. What is the sum of the integers between $\sqrt{17}$ and $\sqrt{150}$?

$\sqrt{17}\ (\sqrt{25}\ \sqrt{36}\ \sqrt{49}\ \sqrt{64}\ \sqrt{81}\ \sqrt{100}\ \sqrt{121}\ \sqrt{144})\ \sqrt{150}$

$5 + 6 + 7 + 8 + 9 + 10 + 11 + 12$

68