THIRD SPACE
LEARNING

7th Grade Ohio State Practice Math Test

Ohio Practice Test Grade 7

Grade 7

Questions

Name: ....

Class: ....

Date: ....

Score: ....

Standard: 7.NS.2

DOK 1

1 Select all the numbers that represent the quotient.

$$(-\frac{3}{7} \div \frac{9}{14})$$

☐ $-\frac{42}{63}$

☐ $-\frac{27}{98}$

☐ $\frac{42}{63}$

☐ $-\frac{2}{3}$

☐ $\frac{2}{3}$

☐ $\frac{27}{98}$

Standard: 7.EE.2

DOK 2

2 Select the expression that is equivalent to the expression below.

$$8 + 7 (2x - 4)$$

- [ ] $9x + 4$
- [ ] $14x - 28$
- [ ] $14x - 20$
- [ ] $9x - 20$
- [ ] $-20 + 14x$
- [ ] $-28 + 14x$

Standard: 7.SP.5

DOK 2

3 The weather app indicates that the probability of snow tomorrow is 0.83. Select the word that best describes the likelihood of snow tomorrow.

- [ ] likely
- [ ] certain
- [ ] unlikely
- [ ] impossible

Standard: 7.EE.3

DOK 1

4 Select the value of x that makes the equation true.

$$2\,(x - 5) + 6 = \frac{1}{2}\,(6x - 18)$$

☐ $x = -5$
☐ $x = 13$
☐ $x = -13$
☐ $x = 5$
☐ $x = -3$

Standard: 7.NS.1.c

DOK 1

5 Select the expression that has the same value as $-\dfrac{4}{9} - \dfrac{3}{10}$

☐ $-\dfrac{4}{9} + \dfrac{3}{10}$

☐ $\dfrac{4}{9} + \dfrac{3}{10}$

☐ $-\dfrac{4}{9} + \left(-\dfrac{3}{10}\right)$

☐ $-\dfrac{4}{9} - \left(-\dfrac{3}{10}\right)$

Standard: 7.RP.2.a
DOK 2

6   Jill is a natural wildlife photographer. She takes the same amount of pictures each day for 8 days. The table below represents the total number of pictures she has after 8 days. How many pictures in total does Jill have on day 3?

Number of days	Total amount of pictures
2	76
5	190
8	304

✏ Answer

Standard: 7.RP.1
DOK 2

7   Bill runs $9\frac{1}{2}$ miles in $1\frac{1}{4}$ hours. Find the average speed in miles per hour.

Answer:_____

Standard: 7.RP.3

DOK 3

8 A pair of jeans that were originally $84.00 are on sale for 20% off. There is a 6% sales tax. How much will you pay for the jeans?
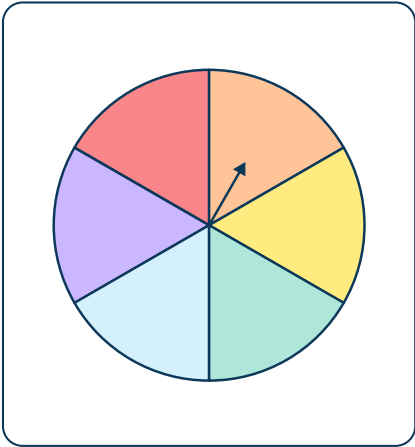
✎ Answer

Standard: 7.SP.7.b

DOK 2

9 The spinner below has 6 equal spaces. The table shows the experimental probability of 60 spins of the spinner. Based on the results, what is the experimental probability that on any one spin, the spinner lands on green?

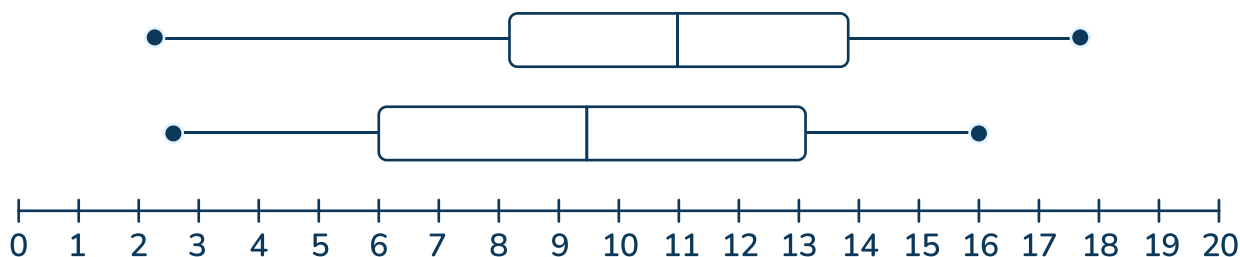| Color	Frequency
Red	8
Orange	12
Yellow	6
Green	17
Blue	10
Purple	7

Answer:_____

Standard: *7.G.4*

DOK 1

10   The diameter of a June's frisbee is 8.4 inches. What is the circumference of the frisbee rounded to the nearest tenth?

✎ Answer

Standard: 6.SP.3.b

DOK 2

11   Select the true statement about the data sets from the box plots below.

☐   The median of the top set of data is less than the median of the bottom data set.

☐   The interquartile range of the bottom data set is greater than the interquartile range of the top data set.

☐   The medians of both data sets are equal.

☐   The interquartile range of both data sets is equal.

Standard: 7.EE.3

DOK 1

12 Find the value of the expression $99 \div 11 - 2(7 - 3)^2$

Answer

Standard: 7.RP.2.b

DOK 1

13 The table below shows the proportional relationship between x and y. What is the constant of proportionality?
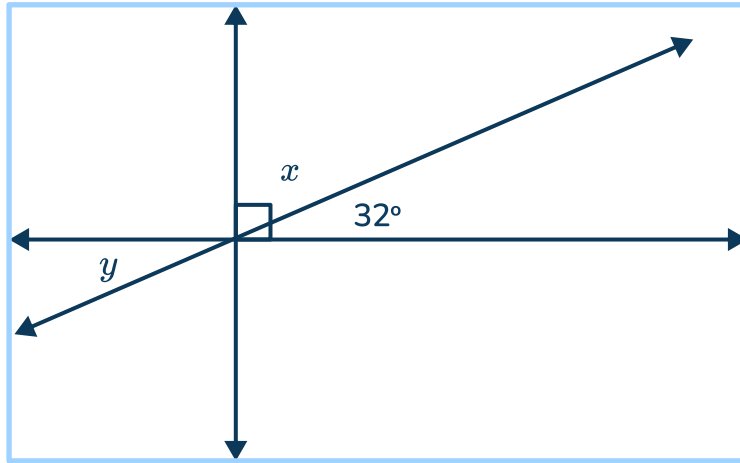
Answer:_____

x	y
2	3.5
3	5.25
5	8.75
7	12.25

Standard: *7.G.5*

DOK *2*

14 Find the value of the angle represented by x and y.

> ✎ Answer

Standard: 7.RP.3

DOK 3

15 Two sporting goods stores are having a holiday sale on kayaks. The original price of the kayak at both stores is $205.

- Store A is having a 25% off sale and
- Store B is having a 20% off sale.

How much more money will a customer pay for the Kayak if they go to Store B?

Answer:_____

Standard: 7.EE.B.4

DOK 3

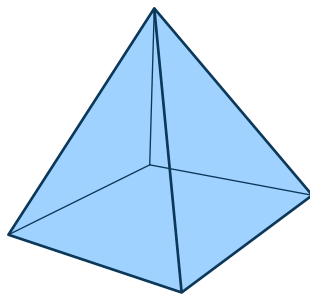16   The expression below represents the perimeter of a square.

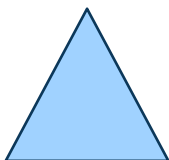$$64x + 8y$$

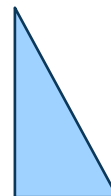Write an expression that represents the length of one of the sides of the square.

Answer:_____

Standard: 7.G.3

DOK 1

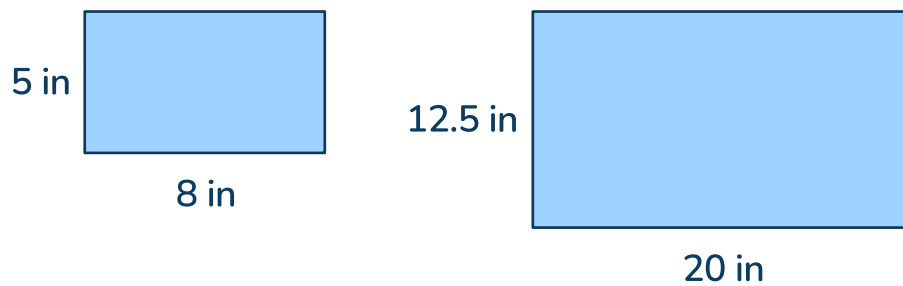17   Select the two-dimensional shape that results from a horizontal cross section of the pyramid below.

Standard: 7.G.1.b

DOK 2

18   The rectangles below are proportional. What is the scale factor from the small rectangle to the large rectangle?

Answer:_____

Standard: 7.RP.2.a
DOK 1

19   Select the table that shows the proportional relationship between x and y.

☐

x	y
2	5
4	10
8	19

☐

x	y
2	6
4	12
8	24

☐

x	y
2	6
4	16
8	40

☐

x	y
2	3
4	6
8	11

Standard: 7.SP.8.a

DOK 2

20 Dara has 5 books. How many ways can she line them up on a shelf?

Answer:_____

Standard: 7.NS.3

DOK 2

21 Overnight, the temperature decreased by 4 degrees. The original temperature was -1° F. Select all the expressions that can be used to represent this situation.

☐ 1 - 4
☐ 1 - (- 4)
☐ - 1 - 4
☐ - 1 + 4
☐ - 1 + (- 4)
☐ 1 - (- 4)
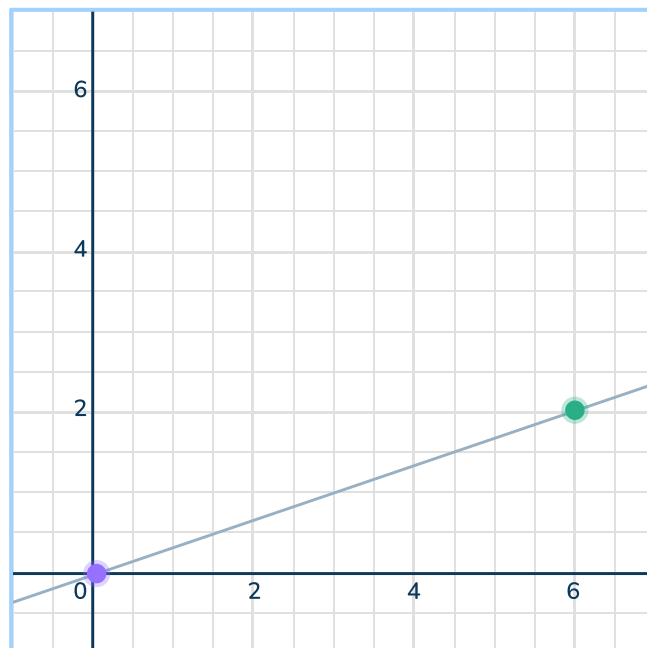
Standard: 7.SP.8.a

DOK 2

22 A coin is flipped 4 times. What is the probability that the coin lands on heads all 4 times?

✏ Answer

Standard: 7.RP.2.a

DOK 2

23 Use the graph below to determine the constant of proportionality.

Answer:_____

Standard: 7.RP.3

DOK 3

24   A diner chef made 120 cups of chicken soup. The diner sold 40% of the soup. If a serving size is $1\frac{1}{2}$ cups. How many servings were sold?

✎ Answer

Standard: 7.EE.3

DOK 3

25   Hazel is hanging 4 square picture frames on the wall. The space between each frame is the same. The frames are 10 inches by 10 inches and the space on the wall measures 10 inches by 60 inches. How far apart is each frame?

x x x 10 inches

60 inches
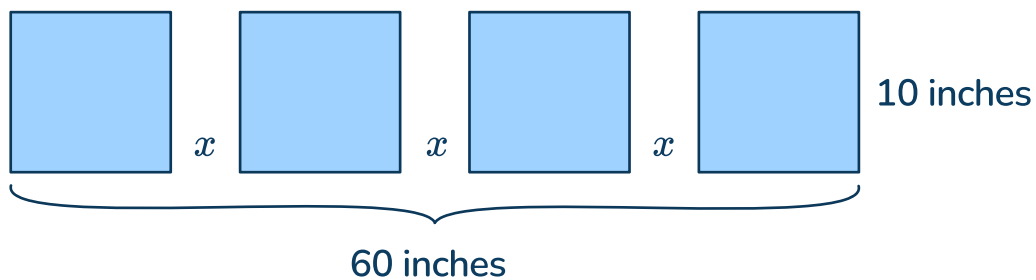
Standard: 7.NS.2.b

DOK 3

26 The temperature in Anchorage, Alaska on Monday night was -15°. Tuesday morning the temperature increased by 8° and then Tuesday night it decreased by 3°. Wednesday morning the temperature increased by 6°. What was the temperature Wednesday morning? Be sure to show all of your work.

Answer:_____

Standard: 7.NS.3

DOK 3

27 A student incorrectly simplifies the expression below. In which step did the student make the first mistake? Make the correction and simplify the expression.

$$\frac{2}{5} (10 - 15) + 8 \div 2$$

- Step 1: $\frac{2}{5} (5) + 8 \div 2$
- Step 2: $2 + 8 \div 2$
- Step 3: $2 + 4$
- Step 4: 6

✎ Answer

Standard: 7.G.2.a

DOK 2

28 A triangle has a side length of 17 cm and a side length of 5 cm. Select the possible side lengths of the third side of the triangle.

☐ 22 cm
☐ 14 cm
☐ 12 cm
☐ 20 cm
☐ 10 cm

Answer:_____

Standard: 7.EE.4.b

DOK 2

29 Kyle is saving to buy new wireless earbuds. The earbuds are $170. Currently, he has $80 saved and just got a new job paying $22 an hour. Write an inequality that can be used to calculate the amount of hours, x, Kyle has to work to have enough money.

Answer:_____

Standard: 7.RP.3

DOK 3

30 Dillion is a speed reader. He reads 105 pages in 7 minutes. If the number of pages he reads is proportional to time, in minutes, what is the unit rate? How many pages will he read in 1 hour?

✎ Answer

Rationales

Item	KEY	Rationale
1	$-\dfrac{42}{63}$ $-\dfrac{2}{3}$	$(-\dfrac{3}{7} \div \dfrac{9}{14})$ $-\dfrac{3}{7} \times \dfrac{14}{19} = -\dfrac{42}{63} = -\dfrac{2}{3}$

Item	KEY	Rationale
2	$14x$ - 20 - 20 + $14x$	$8 + 7 (2x - 4)$ $8 + 14x - 28$ $-20 + 14x$ or $14x - 20$

Item	KEY	Rationale
3	Likely	0.83 means an 83% chance of snow which is very likely.

Item	KEY	Rationale
4	$x = 5$	$2(x - 5) + 6 = \dfrac{1}{2}(6x - 18)$ $2x - 10 + 6 = 3x - 9$ $2x - 4 = 3x - 9$ $-x = -5$ $x = 5$

Item	KEY	Rationale
5	$-\dfrac{4}{9} + (-\dfrac{3}{10})$	$-\dfrac{4}{9} - \dfrac{3}{10}$ is equal to $-\dfrac{4}{9} + (-\dfrac{3}{10})$ because the + and - becomes just -

Item	KEY	Rationale
6	114	3 x 38 = 114 or 38 + 38 + 38 = 114.
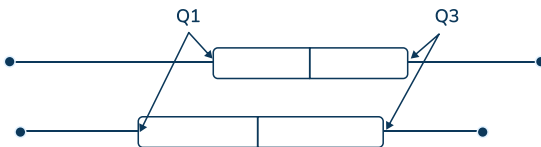
Item	KEY	Rationale
7	$7\frac{3}{5}$ miles per hour	$9\frac{1}{2} \div 1\frac{1}{4} = \frac{19}{2} \div \frac{5}{4} = \frac{19}{2} \times \frac{4}{5} = \frac{76}{10} = 7\frac{6}{10} = 7\frac{3}{5}$

Item	KEY	Rationale
8	$71.23	20% discount means you are paying 80% of the full price. 84 x 0.80 = 67.20 (discount) 67.20 x 0.06 = 4.032 (tax) 67.20 + 4.032 = 71.232 = $71.23

Item	KEY	Rationale
9	$\frac{1}{17}$	Through the experiment the spinner landed on green 17 times which is a probability of $\frac{1}{17}$

Item	KEY	Rationale
10	26.4 inches	$Circumference = \prod \times diameter$ $Circumference = \prod \times 8.4$ $Circumference = 3.14 \times 8.4$ $Circumference = 26.375 \approx 26.4 \ inches$

Item	KEY	Rationale
11	The interquartile range of the bottom data set is greater than the interquartile range of the top data set.	The interquartile range is the difference between quartile 1 and quartile 3. From the box plots, quartile 1 and quartile 3 are the vertical sides of the box. For the top set of data, the interquartile range is 14 - 8 = 6 For the bottom set of data, the interquartile range is 13 - 6 = 7

Ohio State Practice Math Test | Grade 7 | Rationales

Item	KEY	Rationale
12	-23	Following order of operations: 99 ÷ 11 - 2 (7 - 3)² 99 ÷ 11 - 2(16) 99 ÷ 11 - 32 9 - 32 = - 23
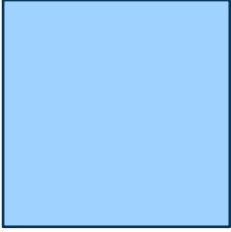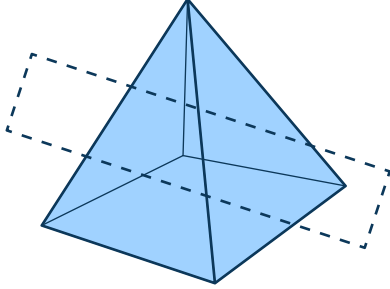
Item	KEY	Rationale
13	1.75	The constant rate between x and y is 1.75. 2 x 1.75 = 3.5 3 x 1.75 = 5.25 5 x 1.75 = 8.75 7 x 1.75 = 12.25

Item	KEY	Rationale
14	x = 58 ° y = 32 °	32 and the angle represented by x are complementary angles. 32 + x = 90 x = 90 - 32 = 58 32 and the angle represented by y are vertical angles. 32 = y

Item	KEY	Rationale
15	$10.25	Price of the kayak at Store A = $153.75 Price of the kayak at Store B = $164 164 - 153.75 = 10.25 $10.25 is how much more a customer will pay for the kayak

Item	KEY	Rationale
16	$16x + 2y$	A square has 4 equal sides. So, divide the expression by 4. $$\frac{64x + 8y}{4} = 16x + 2y$$

Item	KEY	Rationale
17		Slicing the pyramid horizontally, results in a square cross section.

Item	KEY	Rationale
18	Scale factor is 2.5	Since the two rectangles are proportional, a proportion can be written in the form $\frac{5}{8} = \frac{12.5}{20}$ Multiplying the first ratio by 2.5 gives the exact value of the second ratio $\frac{5 \times 2.5}{8 \times 2.5} = \frac{12.5}{20}$. So, the scale factor is 2.5. The scale factor is larger than 1 because the second rectangle is larger than the first rectangle.

Item	KEY	Rationale
19	The second table is the correct choice: x y 2 → 6 4 → 12 8 → 24	From the x value to the y value there is a constant of times 3. Meaning that the values are proportional. $\frac{x}{y} = \frac{2}{6} = \frac{4}{12} = \frac{8}{24} = \frac{1}{3}$

Item	KEY	Rationale
20	120 ways	5 books can be lined up 5 x 4 x 3 x 2 x 1 ways So, 5 x 4 x 3 x 2 x 1 = 120 ways

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Item	KEY	Rationale
21	- 1 - 4 -1 + (- 4)	The expression, - 1 - 4 is interpreted as - 1 minus 4 which translates to - 1 degrees decreased by minus 4 degrees. The expression, -1 + (- 4) is interpreted as - 1 and - 4 or - 1 degrees plus - 4 degrees. The expression also simplifies to be - 1 - 4 which is equivalent to - 1 - 4.

Item	KEY	Rationale
22	$\frac{1}{16}$	The possible outcomes are: HHHH HHHT HHTH HTHH THHH HHTT HTTH HTHT THTH THHT TTHH HTTT THTT TTHT TTTH TTTT

Item	KEY	Rationale
23	$\frac{2}{6}$ or $\frac{1}{3}$	Using the graph there is a constant rate of change from point to point. 2 units up and 6 units right which is a 1 to 3 proportional relationship. For example from the point (0, 0) to the point (2, 6) is 2 units up and 6 units right.

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Item	KEY	Rationale
24	32 servings	120 x 0.40 = 48 (40% of 120) 48 cups of soup were sold and a serving size is $1\frac{1}{2}$ cups $48 \div 1\frac{1}{2}$ $48 \div \frac{3}{2}$ $48 \times \frac{2}{3} = 32$ 32 servings were sold.

Item	KEY	Rationale
25	$6\frac{2}{3}$ inches	Each frame is 10 inches in width which means it makes up 40 inches of the 60 inches of wall space. There are 3 equal spaces in between the frames, $20 \div 3 = 6\frac{2}{3}$ Meaning that each space is $6\frac{2}{3}$ inches

Item	KEY	Rationale
26	-4° on Wednesday morning	-15 + 8 = - 7 -7 - 3 = - 10 -10 + 6 = - 4 The temperature was -4° Wednesday morning.

Ohio State Practice Math Test | Grade 7 | Rationales

Item	KEY	Rationale
27	The student made the mistake in Step 1. The correction is: $\frac{2}{5}$ (10 - 15) + 8 ÷ 2 $\frac{2}{5}$ (- 5) + 8 ÷ 2 The expression simplifies to be 2.	The mistake was first made in Step 1. 10 - 15 is -5 not 5. • Step 1: $\frac{2}{5}$ (- 5) + 8 ÷ 2 • Step 2: -2 + 8 ÷ 2 • Step 3: -2 + 4 • Step 4: 2

Item	KEY	Rationale
28	14 cm 20 cm	For a triangle to be enclosed the two shorter sides of the triangle must sum to be greater than the third side. The triangle has given sides 17 cm and 5 cm. If those two sides are the shorter two sides then 17 + 5 = 22. $22 > than\ the\ third\ side$ In this case, 20 works as the length of the third side. If the 17 cm is the longest side then 5 cm plus the other side must be greater than 17 cm. In this case, 14 cm works because 5 + 14 = 19 and 19 > 17

Item	KEY	Rationale
29	$80 + 22x \geq 170$	$80 + 22x \geq 170$ 80 dollars plus 22 times the amount of hours is greater than or equal to the price of the earbuds.

Item	KEY	Rationale
30	Unit rate: 15 pages per minute Pages read in 1 hour = 900 pages	First calculate the unit rate. $105 \div 7 = 15\ pages\ per\ minute$ Then multiply the unit rate by 60 since there are 60 minutes in one hour. $15 \times 60 = 900\ pages\ in\ 60\ minutes\ which\ is\ 1\ hour$

Breakdown of Assessment				
Ratios & Proportional Relationships	Expressions, Equations, and Inequalities	The Number System	Geometry	Statistics and Probability
30%	20%	17%	16%	17%

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