GRADE 8 HOLIDAY PACKET ANSWER

Name: _____ Class: _____ Date: _____

GRADE 8 MATHEMATICS
HOLIDAY PACKET
THE NUMBER SYSTEM
EQUATIONS & EXPRESSIONS
FUNCTIONS

Directions:

- Read and answer the questions carefully
- Record your answers to this cover page
- Show All Your Work to receive full credit

Questions	Answers
1	
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Score	**%**

Grade 8 Mathematics Reference Sheet

CONVERSIONS

1 yard = 3 feet
1 mile = 5,280 feet

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

CONVERSIONS ACROSS MEASUREMENT SYSTEMS

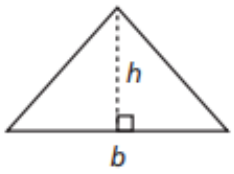
1 inch = 2.54 centimeters
1 meter = 39.37 inches
1 mile = 1.609 kilometers
1 kilometer = 0.6214 mile

1 gallon = 3.785 liters
1 liter = 0.2642 gallon

1 pound = 0.454 kilogram
1 kilogram = 2.2 pounds

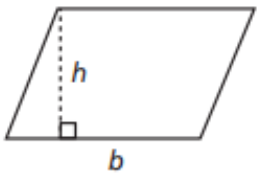
FORMULAS AND FIGURES

Triangle



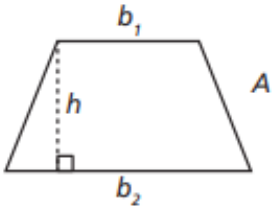
$A = \frac{1}{2}bh$

Parallelogram



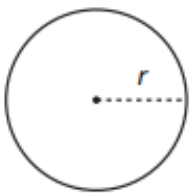
$A = bh$

Trapezoid



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

Circle

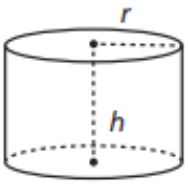


$C = 2\pi r$
$C = \pi d$
$A = \pi r^2$

General Prism

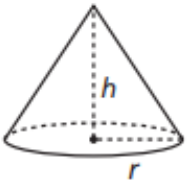
$V = Bh$

Right Cylinder



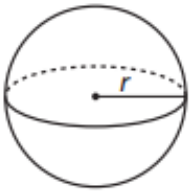
$V = \pi r^2 h$

Right Cone



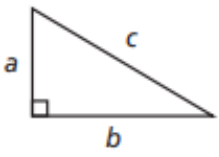
$V = \frac{1}{3}\pi r^2 h$

Sphere



$V = \frac{4}{3}\pi r^3$

Pythagorean Theorem



$c^2 = a^2 + b^2$

1. Which of the following expressions is *not* equivalent to $\frac{1}{25}$?

A. $5^3 \times 5^{-5}$ B. $5^{-1} \times 5^{-1}$ C. $5^{-3} \times 5$ D. $5^{-2} \times 5^4$

2. Which of the following is equivalent to $5^2 + 5^2$?

A. 10^2 B. 5^4 C. 20 D. 2×5^2

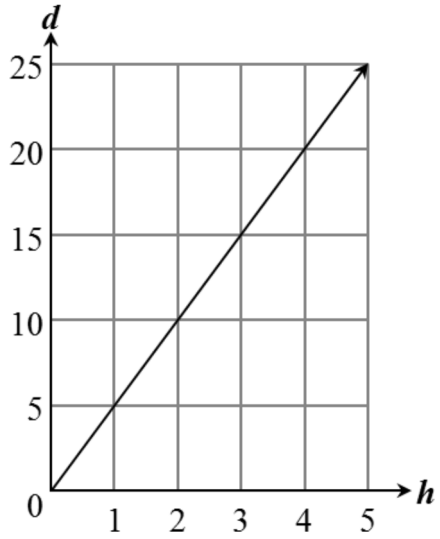
3. The table shows the relationship between the number of hours, h, John has been hiking and the total distance, d, he has traveled in kilometers.

John

h	0	1	2	3	4	5
d	0	4	8	12	16	20

The graph shows the distance Sara hiked over the same time period.

Sara



Who hikes faster?

A. Sara

B. John

C. They hike at the same rate

D. There is not enough information to determine

4.

x	y
-8	-42
-3	-17
0	-2
6	28

If a line contains the points in the table above, what is the equation of the line?

A. $y = 2x + 5$ B. $y = 2x - 5$ C. $y = 5x - 2$ D. $y = -5x - 2$

5. If $d = 110$ and $a = 20$ in the formula $d = \frac{a}{2}(2t - 1)$, then what is the value of t?

A. $\frac{15}{22}$ B. $\frac{15}{8}$ C. $\frac{111}{20}$ D. 6

6. $\frac{2}{3}(2x - 1) + 2\frac{1}{3} = 7 + \frac{1}{2}x$

Which step would *not* be a possible first step for solving this equation algebraically?

A. Multiplying every term in the equation by 6

B. Subtracting $2\frac{1}{3}$ from 7

C. Subtracting $\frac{1}{2}x$ from $2x$

D. Multiplying -1 by $\frac{2}{3}$

7. Solve $10y + 7 - 4y = -5 + 6y + 22$. Tell whether the equation has infinitely many solutions or no solution.

A. Infinitely many solutions B. Only one solution

C. Two solutions D. No solutions

8. In which table is y a function of x?

A.

x	y
-3	6
2	5
3	2
2	3

B.

x	y
-1	0
5	2
7	3
5	4

C.

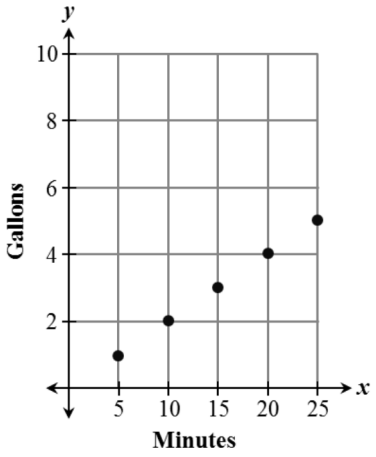
x	y
2	-1
3	0
4	-5
5	7

D.

x	y
0	6
-1	3
2	4
-1	5

9. Rain is flowing into two containers at different rates. The figure below shows the volume of water in each container at different times.

Container 1



Container 2

Minutes	Gallons
5	2
10	4
15	6
20	8
25	10

What is the difference in the rate of change between the two containers?

A. $\frac{1}{5}$ gallon per minute

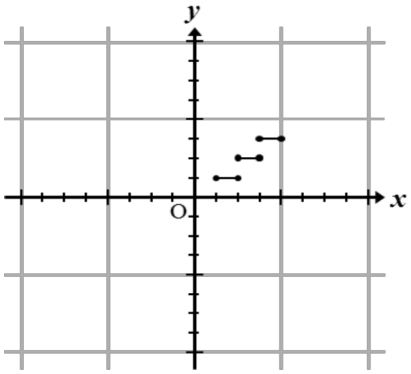
B. $\frac{3}{5}$ gallon per minute

C. $\frac{5}{2}$ gallon per minute

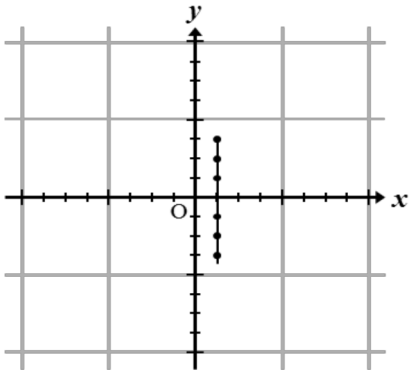
D. $\frac{15}{2}$ gallon per minute

10. Which of the following could be the graph of a function?

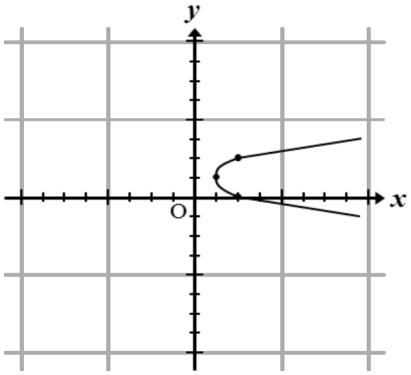
A.



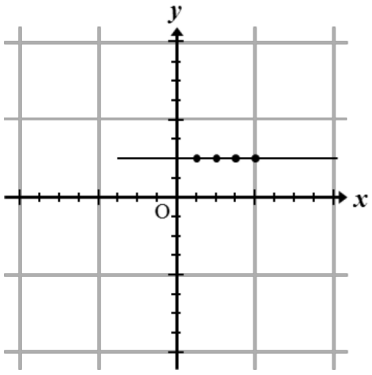
B.



C.



D.



11. Which function is nonlinear?

A. $y = \dfrac{3x + 1}{2}$

B. $y = -x$

C. $y = 2x(x - 4)$

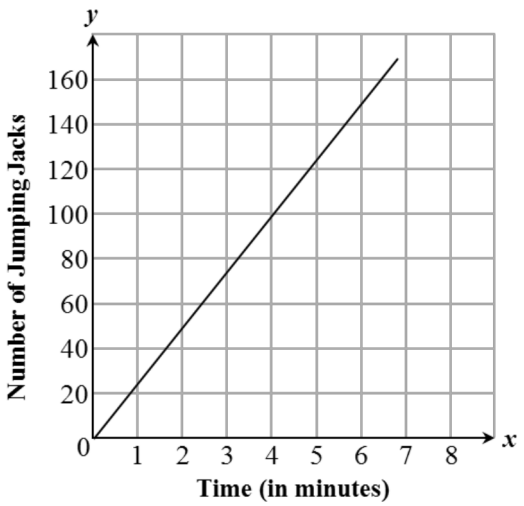
D. $y = \frac{1}{2}x - 7$

12. Alicia and Melissa did jumping jacks. The table below shows the number of jumping jacks that Alicia had done in different amounts of time.

Alicia

Time (minutes)	1	2	3	4	5	6	7	8
Jumping Jacks	30	60	90	120	150	180	210	240

The graph below shows the number of jumping jacks Melissa had done in different amounts of time.



Which choice best describes the difference between the rates at which the girls did jumping jacks?

A. Melissa did 6 more jumping jacks per minute than Alicia.

B. Alicia did 6 more jumping jacks per minute than Melissa.

C. Melissa did 5 more jumping jacks per minute than Alicia.

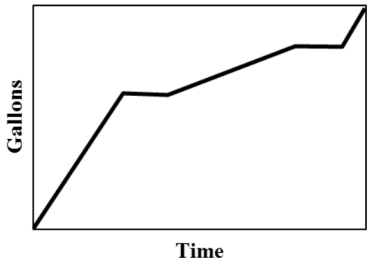
D. Alicia did 5 more jumping jacks per minute than Melissa.

13. Mr. Jones filled his swimming pool with water.

- Mr. Jones began filling the pool at a constant rate.
- He turned off the water for a while.
- He then turned the water back on at a slower constant rate.
- Mr. Jones turned off the water again for a while.
- He then turned the water back on at the first rate.

Which graph *best* represents Mr. Jones filling the pool?

A.



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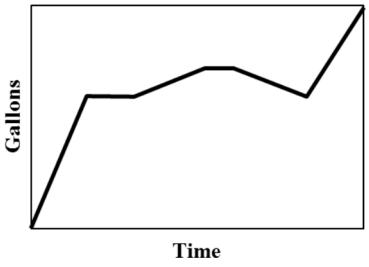
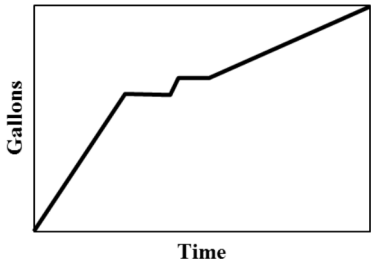
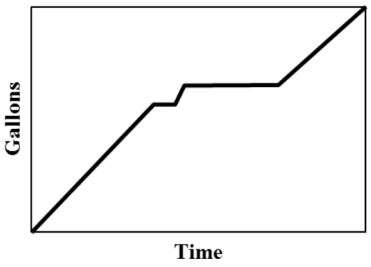


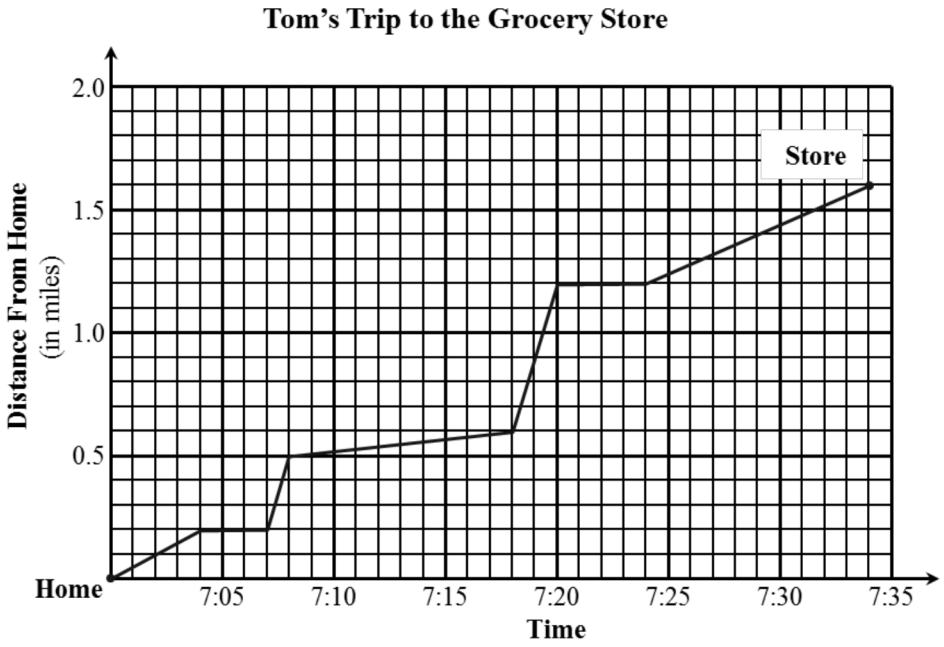
C.



D.



14. Tom went to the grocery store. The graph below shows Tom's distance from home during his trip.



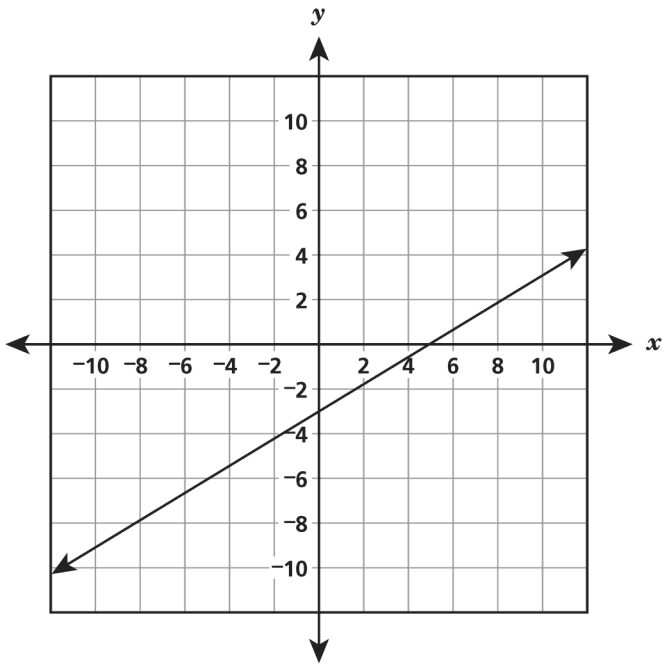
Tom stopped twice to rest on his trip to the store. What is the total amount of time that he spent resting?

A. 5 minutes B. 7 minutes C. 8 minutes D. 10 minutes

15. Which exponential expression is equal to $2^{-5} \cdot 2^{8}$?

A. $\frac{2^{2}}{2^{-1}}$ B. $\left(2^{3}\right)^{-1}$ C. $\frac{2^{-2}}{2^{-1}}$ D. $\left(2^{-1}\right)^{3}$

16. Function 1 is defined by the equation $y = \frac{3}{4}x + 1$, and function 2 is represented by the graph below.



Which statement about the functions is true?

A. Function 1 has the greater rate of change and the greater *y*-intercept.

B. Function 2 has the greater rate of change and the greater *y*-intercept.

C. Function 1 has the greater rate of change, and function 2 has the greater *y*-intercept.

D. Function 2 has the greater rate of change, and function 1 has the greater *y*-intercept.

17. Which number is equivalent to $\frac{3^4}{3^2}$

A. 2 B. 9 C. 81 D. 729

18. The four tables below show relationships in which the x values represent inputs and the y values represent the corresponding outputs.

Q

x	y
−2	−3
1	3
3	−3
5	3

R

x	y
−1	−5
2	4
3	7
4	10

S

x	y
−2	3
1	3
3	3
5	3

T

x	y
3	4
4	5
3	−4
4	−5

Which table represents a relationship that is *not* a function?

A. Q B. R C. S D. T

19. Madison created two functions.

For Function A, the value of y is two less than four times the value of x. The table below represents Function B.

Function B

x	y
−3	−9
−1	−5
1	−1
3	3

In comparing the rates of change, which statement about Function A and Function B is true?

A. Function A and Function B have the same rate of change.

B. Function A has a greater rate of change than Function B has.

C. Function A and Function B both have negative rates of change.

D. Function A has a negative rate of change and Function B has a positive rate of change.

20. Which expression is equivalent to $4^7 \times 4^{-5}$

A. 4^{12} B. 4^2 C. 4^{-2} D. 4^{-35}

21. The table below represents a linear function.

x	y
-1	5
1	9
3	13
5	17

Which function has a greater slope and a greater y-intercept than the linear function represented in the table?

A. $y = 2x + 8.5$ B. $y = 3x + 7.5$

C. $y = 5x + 6.5$ D. $y = 10x + 5.5$

22. Simplify:

$$\frac{4^8}{4^{-4}}$$

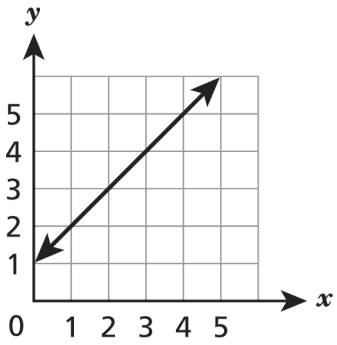
A. 4^{-32} B. 4^{-2} C. 4^4 D. 4^{12}

23. Which expression is *not* equivalent to $\frac{6^3}{6^6}$?

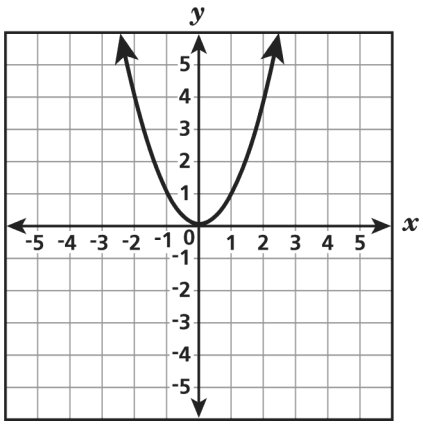
A. $\frac{1}{6^2}$ B. 6^{-3} C. $\frac{1}{216}$ D. $\frac{1}{6^3}$

24. Which graph below does *not* represent a function of x?

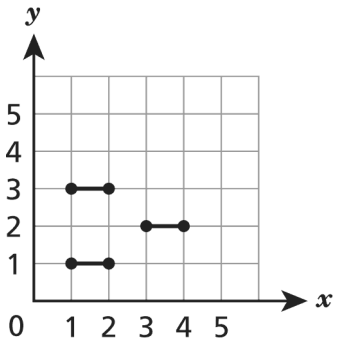
A.



B.



C.



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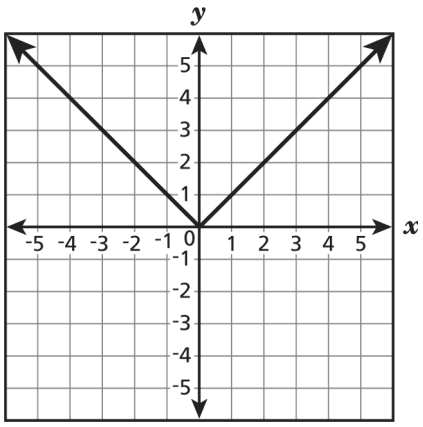

25. Which equation does *not* represent a linear function of x?

A. $y = -\frac{3}{4}x$ B. $y = \frac{x}{2}$ C. $y = -3 + 2x$ D. $y = 3x^2 - 2$