

7.D.1.1 Recognize, reproduce, extend and/or describe patterns, sequences and relationships

Standard: 7.D.1 Demonstrate an understanding of patterns, relations and functions

7.D.1.1.1 Describe, extend or find a missing element of a pattern (show 3 repetitions of the pattern) • fractions or decimals - may use only one operation from +, - or x • whole numbers – may use only one operation from +, -, x, ÷ or squares

2MC

The numbers below follow a pattern:

1640, 729, 324, 144, (64)

The pattern continues. Which is the next number in this pattern?

72 (cannot divide by 2) 48 (cannot divide by 3) 36 (cannot divide by 4) \*64

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The numbers below follow a pattern

What is the missing number in the pattern  $14/5$   $28/25$   $56/125$ , ? ,  $244/3125$

$122/625$ ,  $224/1125$   $168/625$ ,  $122/375$  ,

7.D.2.1 Select and/or use appropriate strategies to solve or represent equations or expressions

Standard: 7.D.2 Represent and/or analyze mathematical situations and structures using algebraic symbols, words, tables, and graphs

7.D.2.1.1 Select and/or use appropriate strategies to solve one-step equations (no negative numbers)

2MC

What is the numerical value of x in this equation?  $8/15 x = 8$

$1/15$  (erroneously solves for x in the denominator instead of the numerator on the left side of the equation,  $64/15$  (multiplies by  $8/15$  instead of  $15/8$  ,  $15$ ,  $120$  (multiplies by  $15$  and erroneously solves equation for  $8x$ )  $256$  (error simplifying right side of equation after multiplying by  $15/8$ ).

What is the numerical value of y in this equation:  $580=y-145$

$4$  (erroneously attempts to solve by dividing both sides by  $145$   $435$  (subtracts instead of adds)  $715$  (arithmetic error adding  $145$  to both sides)  $*725$

7.D.2.1 Select and/or use appropriate strategies to solve or represent equations or expressions

Standard: 7.D.2 Represent and/or analyze mathematical situations and structures using algebraic symbols, words, tables, and graphs

7.D.2.1.2 Use substitution of one and/or two variables to simplify expressions (whole numbers only – use order of operations)

2MC

Gerald was asked to generate a data point by substituting values for X and Y into this algebraic expression:  $6(x-2) - (2x - y) + 25$ . What is the numeric value of the expression when  $X=25$  and  $y=15$

.  
a)  $6x23 - (35) + 25 = 138 - 35 + 25 = 128^*$     b)  $138 - 50 - 15 + 25 = 98$  ( fails to change minus sign to plus in simplifying second parenthetical expression    c)  $(6x25 - 2) 148 - 50 - 15 + 25 = 93$  fails to distribute multiplication by 6 to second term in first parenthetical expression and error distributing subtraction operation over second parenthetical expression    d)  $148 - 50 + 15 + 25 = 138$  (fails to distribute multiplication by 6 to second term in first parenthetical expression.

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What is the numerical value of the algebraic expression  $2x^2 - xy$  divided by  $y$  when  $x=16$  and  $y=4$

c)  $512 - 64/4 = 496^*$     b)  $512 - 64$  is  $(448 / 4 = 112$  (erroneously combines first and second terms before dividing by 4)    a)  $(64 - 64/4 = 48$  (fails to multiply square of first variable by 2 and also erroneously combines first and second term before dividing by 4    256    d)  $32e2 = 1024 - 16 = 1008$  (erroneously multiplies variable in first term by two before squaring it

7.D.2.2 Create and/or interpret expressions, equations or inequalities that model problem situations

Standard: 7.D.2 Represent and/or analyze mathematical situations and structures using algebraic symbols, words, tables, and graphs

7.D.2.2.1 Identify expressions, equations or inequalities that model mathematical situations (using whole numbers or decimals, no more than two operations and one variable)

2MC

Donald's father is 42 years old. This is 12 years more than twice Donald's age. Which equation can be used to solve for Donald's age.  $2d + 12 = 42$   $2d - 12 = 42$   $2(d + 12) = 42$ ,  $d/2 + 12 = 42$

Charles runs 50 yards in a football game, which is more than twice the number of yards than Reggie runs. Which mathematical statement accurately describes the number of yards that Reggie runs in the game.  $50 > 2r$   $50 = 2r$   $50$  greater than or equal  $r$ ,  $50 < 2r$

in a football game. Reggie runs 50 yards.

. Which mathematical statement accurately expresses the number of yards that Charles runs in the game.  $2c = 50$ ,  $c > 100$

Charles runs a total of 104 yards.

$c - 50 > 104$

$2r + 50 > 104$

$50 + 2r > 104$   $50 + 2r = 104$   $50 > 2r - 104$ ,  $104 < 50 + c$

rite an expression that scored 3 points less than twice the total points Reggie scored in a football game. Reggie scored 24 by that

His father is Donald's father is 12 years younger than twice Donald's age. is twice as old asked to write a mathematical expression

7.D.3.1 Describe the relationship between two variables (e.g., time, temperature).

Standard: 7.D.3 Analyze change in various contexts

7.D.3.1.1 Solve problems involving a constant rate of change (e.g., word problems, graphs or data tables).

2MC

Sue makes a chart of the rainfall reported during a storm. If rain continues to fall at this rate and the storm continues for another two hours, how much rain will have fallen at the end of the 6<sup>th</sup> hour ?

Hours	Rainfall
1	1-1/2 inches
2	3 inches
3	4 -1/2 inches
4	6 inches
5	?
6	?

7-1./2 inches 9 inches 12 inches 30 inches

The graph below shows the month-to-month sales revenue reported by a business over a four month period. Assuming that sales revenue continues to increase at the same constant rate, what will be the revenue reported for July?. Apr 1200 \$1500 , \$1800, \$2000 \*\$2100

over balance statements for Jack's savings account. Assuming that the balance continues to increase at a constant rate, how much money will be in the account in May.