Topics to review

- Commutative, associative, distributive, and identity property

(1) (2)

Problem 1

Which expression is the same as the expression shown?

(1) a×b = ?

(A) b+a
(B) b×a
(C) a
(D) none of the above

- same letters/variables
- same operation/symbols
- order doesn't change value

a×b → multiplication
a·b
a(b)

a×b = 4×3 = 12
b×a = 3×4 = 12

Check: a=4, b=3
a+b = b+a

(2) a×b+a×c = ? a(b+c)

(A) a+b×c
(B) a(b+c)
(C) (a+b)(a+c)
(D) a×b+c

a×b = a , b = 1
a×b = a , b = 0 , a = 0

(3) a+(b+c) = ? (a+b)+c

(A) ~~a+b×c~~
(B) ~~a(b+c)~~
(C) (a+b)(a+c)
(D) (a+b)+c

- Addition

a×b = b+a , a = 2 = b
2×2 = 2+2 = 4

= (b+c)+a = (a+c)+b = a+b+c
= b+c+a

(4) a(b+c) = ? a·b + a·c

(A) a×b+a×c
(B) a(b+c)
(C) (a+b)(a+c)
(D) (a+b)+c

(2) $a \times b + a \times c$

$a \cdot b + a \cdot c$

$4 \cdot 3 + 4 \cdot 5$

$12 + 20 = 32$

$(a \times b) + (a \times c)$

$a(b+c)$

$a(b+c)$

$4(3+5)$

$4(8)$

32

$a(b+c)$ • Distribute - Multiplication

$a \cdot b + a \cdot c = a \cdot c + a \cdot b = c \cdot a + b \cdot a = b \cdot a + c \cdot a = a \cdot b + a \cdot c$

$a \cdot c + b \cdot a = \cancel{2a + b + c} =$

$3 \cdot 5 + 4 \cdot 3 \quad 2 \cdot 3 + 4 + 5$

$15 + 12 \quad 6 + 4 + 5 = 15$

32

$\cancel{a} \cdot b + \cancel{a} \cdot c$ • Find whats in common $a \cdot \square$

$a(b+c)$ • Factor out the common term a

$a(b-c) = a \cdot b - a \cdot c \neq a \cdot c - a \cdot b$

$\frac{2}{7x} - 3 = \frac{7x}{2} + 3 =$

Problem 2

What number goes in the box to make the equation true?

(A) 4
(B) 16
(C) 8
(D) 13

$35 - \square = 9 \times 3$

$35 - x = 9 \times 3$

$35 - x = 27$

$35 - 27 = 8 = x$

$x = \quad , = x$

$35 - x = 27$

$-27 \quad -27$

$35 - x - 27 = 0$

$+x \quad +x$

$35 - 27 = x$

$8 = x$

Topics to review:

- Multiplying fractions with whole numbers (only need to watch until 4:15)

Problem 3

Two-thirds of the chairs were donated. How many chairs were donated?

15

(A) 10 chairs
(B) 5 chairs
(C) 12 chairs
(D) 9 chairs

h h h h h
h h h h h
h h h h h

← Please pretend these are chairs

$\frac{2}{3} \cdot \frac{15}{1}$

$\frac{2 \cdot 15}{3}$

$\frac{30}{3} = 10$

$\frac{1}{3} = 33\%$

$\frac{2}{3} = 66\%$

$0.66 \cdot 15 \approx 10$

Topics to review:

- Finding patterns in numbers

$\frac{3}{5}$ of the chairs

$\frac{3}{5} \cdot 15 = \frac{45}{5} = 9$

Problem 4

Look at the number pattern:

$\frac{3}{1}, \frac{7}{2}, \frac{15}{3}, \frac{31}{4}, \frac{63}{5}, \ldots \; - - - \frac{1023}{9}$

What is the rule for the pattern?

(A) Multiply by 3 and then subtract 2 to get the next number in the pattern.

~~(B) Add 4~~ to get the next number in the pattern.

(C) Multiply by 2 and then add 1 to get the next number in the pattern.

(D) Add 5 and then subtract 1 to get the next number in the pattern.

$a_1 \cdot 2 + 1 = 2a_1 + 1$

Problem 5

The formula 2x + 7y shows the cost of x packs of index cards and y packs of printer paper at Ollie's Office Supply. Alexandra needs to buy 6 packs of index cards and 4 packs of printer paper for her class. What is the total cost?

(A) \$43
(B) \$19
(C) \$50
(D) \$40

2x + 7y x: index, y: paper
6 4
x y
2(6) + 7·4 =
12 + 28 = \$40

2x+7y
2(x)+7(y)

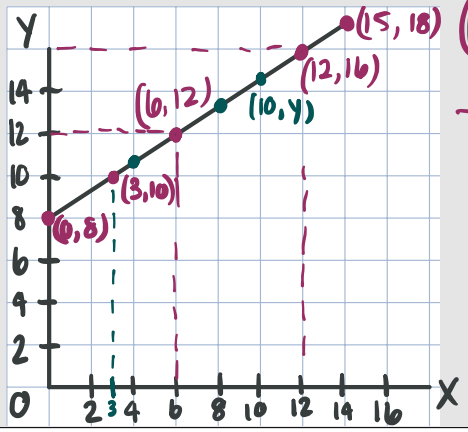
Mult. notation
x × y x×2
x · y x·2
x(y) x(2)
xy x2
y=2

Topics to review:

- Slope-intercept equation from two points
- Worked example: slope from two points
- How to determine if a point lies on a line or not using the point and the equation

Problem 6

The graph of a straight line is shown in the coordinate plane. Use the graph to answer the question. The graph of the line continues. Which point is also on the line?



(A) (24,24)
(B) (8,12)
(C) (18,16)
(D) (18,22)

point on the plane: (x, y)

2/3

4/6

(6,12)
(12,16) → (18,20)

2/3

x → +6 (run) (x, y)
y → +4 (rise) (30,28)
(36,32)

* rate, ratios, proportions

(6,12) and (12,16)
(x₁, y₁) (x₂, y₂)

4 per 6
4/6

$\frac{12-16}{6-12} = \frac{y_1 - y_2}{x_1 - x_2}$ $\quad \frac{4}{6} = \frac{2}{3}$ (rise) y / (run) x

$= \frac{-4}{-6} = \frac{-1 \cdot 4}{-1 \cdot 6} = \frac{-1}{-1} \cdot \frac{4}{6} = \frac{4}{6} = \frac{2}{3}$

$$\frac{y_2 - y_1}{x_2 - x_1} = \frac{16-12}{12-6} = \frac{4}{6}$$

$$\frac{y_2 - y_1}{x_2 - x_1} = \frac{12-8}{6-0} = \frac{4}{6} = \frac{2}{3} \checkmark$$

$(0, 8)$ (x_1, y_1)

$(6, 12)$ (x_2, y_2)

Slope: $\frac{y_2 - y_1}{x_2 - x_1} = m$

Equation of a line

$y = mx + b$

$\frac{2}{3} = m$: slope

$8 = b$: y-intercept

$y = \frac{2}{3}x + 8$

$18 = \frac{2}{3}(15) + 8$

$18 = 10 + 8 = 18 \checkmark$

Building our line! $(15, 18)$ (x, y)

$\frac{2}{3} \cdot \frac{15}{1} = \frac{30}{3} = 10$

$y = \frac{2}{3}x + 8$ $\quad (10, y) \rightarrow (10, 14.6)$

(x, y)

$y = \frac{2}{3}(10) + 8 = 14.6$