

Do Now: Use the order of operations to simplify each expressions.

1. $8 \cdot 3 - 2 \cdot 4$

2. $28 - 4 + 6 \div 5$

3. $24 \div 12 \cdot 4 \div 3$

4. $3 \cdot 8^2 + 12 \div 4$

5. $(40 + 24) \div 8 - (2^3 + 1)$

Algebra 2

Ch. 1 Handout 1.2

Algebraic Expressions

Properties for Simplifying Algebraic Expressions:

Let a , b , and c represent real numbers

Definition of Subtraction: $a - b = a + (-b)$

Subtraction means add the opposite

Definition of Division: $a \div b = a \cdot \frac{1}{b}$

Division means multiply by the Reciprocal

Ex: $\frac{15}{22} \div \frac{27}{34} = \frac{15}{22} \cdot \frac{34}{27} = \frac{85}{99}$

Reciprocal

Distributive Property of Subtraction: $a(b - c) = ab - ac$



Distributive Property of Addition: $a(b + c) = ab + ac$



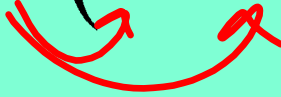
Multiplication by 0: $0 \cdot a = 0$

Multiplication by -1: $-1 \cdot a = -a$

Opposite of a Sum: $-(a + b) = -a + (-b)$



Opposite of a Difference: $-(a - b) = b - a$



Opposite of a Product: $-(ab) = -a \cdot b = a \cdot (-b)$

Opposite of an opposite: $-(-a) = a$

A variable

Pull

is a symbol, usually a letter that represents one or more numbers

$$\text{Ex: } x; y$$

An algebraic expression or a variable expression

Pull

is an expression that contains one or more variables

$$\text{Ex: } 3x^2y; \frac{1}{2}abc$$

To evaluate an expression

Pull

you substitute numbers for the variables in an expression and follow the order of operations

$$\text{Ex: } 3x^2y \text{ where } x=3, y=2$$

$$3(\underline{3})^2 \cdot \underline{2} = 3(9) + 2 = 27 + 2 = \textcircled{29}$$

A term

Pull

is a number, a variable, or the product of a number and one or more variables

monomial : one term ex: $3x^2y$

binomial : two terms ex: $2x + 1$

trinomial : three terms ex: $3x^2 + 2x + 1$

A coefficient

Pull

is the numerical factor in a term.

1. Evaluate $(k-18)^2 - 4k$
for $k = 6$

$$(\textcolor{red}{6} - 18)^2 - 4(\textcolor{red}{6})$$

$$(-12)^2 - 24$$

$$144 - 24 = \boxed{120}$$

The expression $-0.08y^2 + 3y$ models the percent increase of voters in a town from 1990 to 2000. In the expression, y represents the number of years since 1990. Find the approximate percent of increase of voters by 1998.

$$\begin{aligned} y = 8 & \quad - .08y^2 + 3y \\ & = -.08(\textcolor{red}{8})^2 + 3(\textcolor{red}{8}) \\ & = -.08(64) + 24 \\ & = -5.12 + 24 = 18.88\% \end{aligned}$$

Assume that the model above holds for future years. What percent of the eligible voters will vote in 2012? In 2020?

$$\begin{aligned} & \quad .08y^2 + 3y \\ y = 22 & \quad .08(\textcolor{red}{22})^2 + 3(\textcolor{red}{22}) \end{aligned}$$

3. Evaluate each expression for $c = -3$ and $d = 5$.

a) $c^2 - d^2$

$$(-3)^2 - (5)^2$$

$$9 - 25 = \boxed{-16}$$

3. Evaluate each expression for $c = -3$ and $d = 5$.

b) $c(3 - d) - c^2$

$$-3(3 - 5) - (-3)^2$$

$$-3(-2) - 9$$

$$6 - 9 = \boxed{-3}$$

3. Evaluate each expression for $c = -3$ and $d = 5$.

$$\begin{aligned} \text{c) } & -d^2 - 4(d - 2c) \\ & -(5)^2 - 4(5 - 2(-3)) \\ & -25 - 4(5 + 6) \\ & -25 - 4(11) \\ & -25 - 44 = \boxed{-69} \end{aligned}$$

4. Simplify.

a) $\underline{2x^2} + \underline{5x} - \underline{4x^2} + \underline{x} - \underline{x^2}$

$$-3x^2 + 6x$$

4. Simplify and justify each step.

$$\text{b) } 2(r + s) - \frac{1}{4}(2r - 4s)$$

$$2(r + s) + -\frac{1}{4}(2r - 4s)$$

$$\underline{2r} + \underline{2s} + -\underline{\frac{1}{2}r} + \underline{s}$$

$$\boxed{\frac{3}{2}r + 3s}$$

4. Simplify and justify each step:

$$c) \quad 2h - \frac{\cancel{2}}{\cancel{3}} \left(\frac{\cancel{3}}{\cancel{2}} k \right) + 7(2h - 3k)$$

$$\underline{2h} - \underline{\underline{k}} + \underline{14h} - \underline{\underline{21k}}$$

$$\boxed{16h - 22k}$$

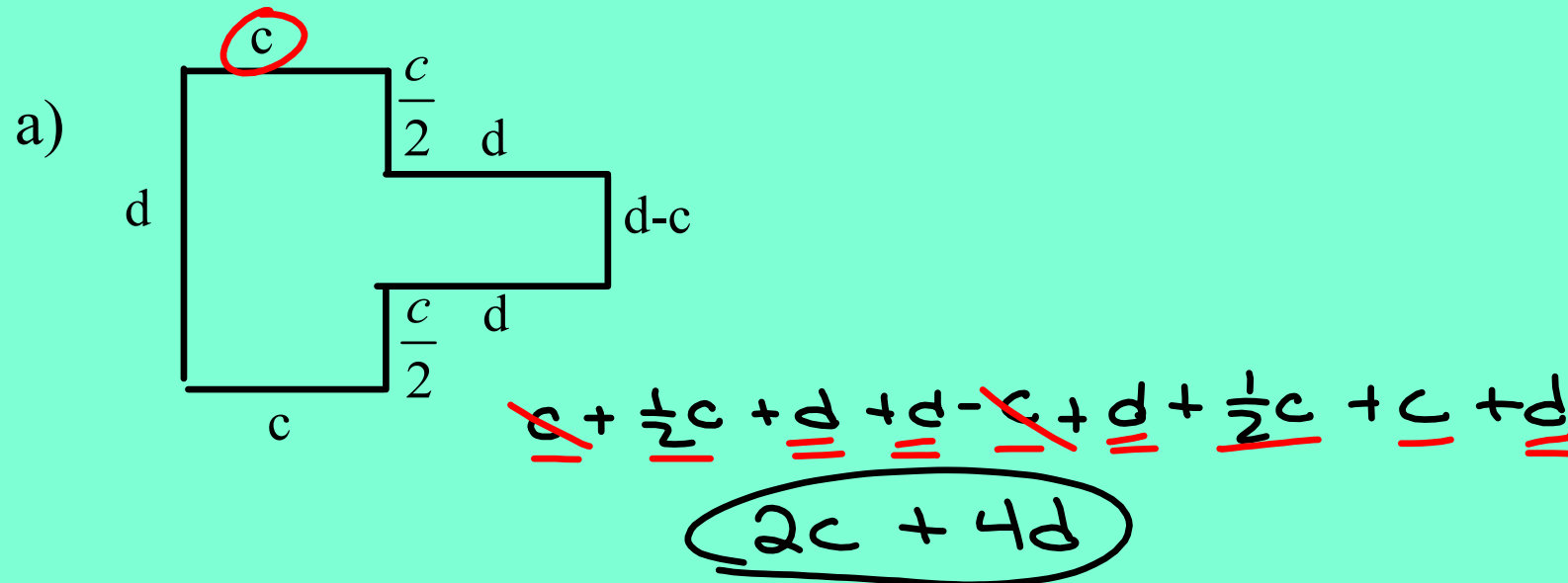
Simplify and justify each step:

$$\frac{1}{5}[(x+5)+(-x)]$$

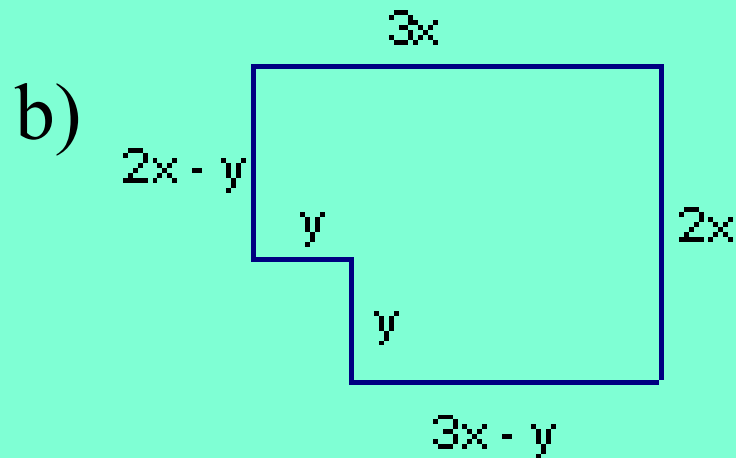
$$\frac{1}{5}[\cancel{x} + 5 + \cancel{-x}]$$

$$\frac{1}{5}(5) = \boxed{1}$$

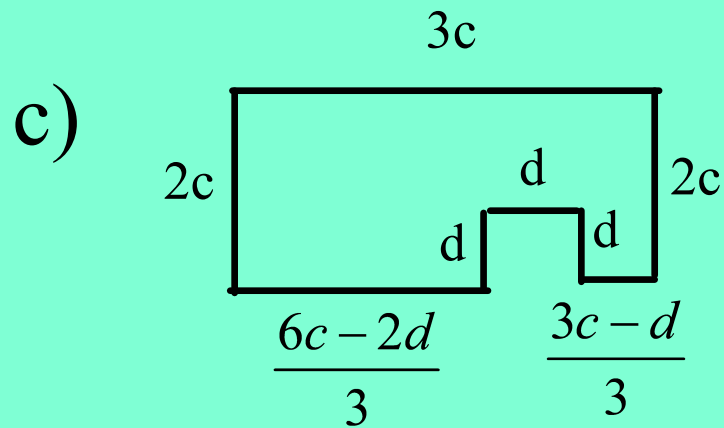
5. Find the perimeter of each figure.
Simplify the answer.



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Simplify the answer.



Assignment

1.2 Pgs 15-17 2-14 evens, 18,
21-45, 47-64, 66

Show All Work!!