Algebra 1

UCS Summer Review Packet

(For students entering Algebra I)

- This packet will be graded for accuracy and will be the first Algebra I test grade.
- This packet is due on the 1st day of school at the beginning of your class period.

Student Name: _____ Class Period:____

VARIABLES & EXPRESSIONS

Translate each algebraic expression or verbal expression.

VERBAL EXPRESSION	ALGEBRAIC EXPRESSION
8 times a number x is subtracted by 4	
	$6x^2 + 7$
5 increased by the product of -3 and a number x	
	$3x + 4y - 2$
3 times the sum of a number x and 7	
	$\frac{x}{2} + 4x$
A number y cubed plus x squared decreased by 7	
	$5(x - 4) + 2$
the difference of x and y is divided by 3 and added by 8	
	$-2(x + 4)^2 - 1$

ORDER OF OPERATIONS

Simplify each expression using the order of operations.

1. $5 - 6 + 2(3)$	2. $4 + 5(7 - 1) + \frac{8}{2}$
3. $-9(4 + 2) - 2(3) + 4^2$	4. $7 - 2[-6 - (3 + 1)] - \frac{8 + 7}{3}$
5. $0.5(-8 - 4) + 3(8 - 2^2)$	6. $3 - 5(2) - 7(5^2 - 4^2)$
7. $2(3)^2 - 4(3) + 1$	8. $4(3 - 5)^3 + 5$

THE NUMBER PROPERTIES

Match each expression with the property that it shows.

$5 + 0 = 5$	Commutative Property of Addition
$5(1) = 5$	Associative Property of Addition
$5(0) = 0$	Additive Identity
$2 + 3 = 3 + 2$	Distributive Property
$2(3) = 3(2)$	Commutative Property of Multiplication
$2 + (3 + 4) = (2 + 3) + 4$	Associative Property of Multiplication
$2(3 \cdot 4) = (2 \cdot 3)4$	Zero Product Property
$3(2 + 5) = 6 + 15$	Multiplicative Identity

EVALUATING EXPRESSIONS

Evaluate each expression given the following values for each variable.

a = 2	b = -3	c = 4	d = -5	e = 6	f = -7

1. $2a + 3d$	2. $b^2 - e^2$
3. $-3c - (a + d) + f$	4. $2(b - e) + (f + c)^2$
5. $\frac{d - c}{3} - 4(ab + f)$	6. $c(ab - 1) + de - f^2$

ADDING & SUBTRACTING FRACTIONS

Add or subtract the fractions. Simplify your answer.

$\frac{1}{2}+\frac{1}{2}=$ $\frac{1}{3}+\frac{1}{3}=$ $\frac{1}{4}+\frac{2}{4}=$

$\frac{2}{5}-\frac{1}{5}=$ $\frac{3}{6}-\frac{5}{6}=$ $\frac{1}{7}-\frac{8}{7}=$

$\frac{5}{8}-\frac{7}{8}=$ $-\frac{5}{9}-\frac{1}{9}=$ $-\frac{3}{10}+\frac{7}{10}=$

$\frac{1}{2}+\frac{5}{4}=$ $\frac{2}{9}+\frac{1}{3}=$ $\frac{1}{4}+\frac{2}{16}=$

$\frac{2}{3}-\frac{1}{5}=$ $\frac{3}{6}-\frac{5}{4}=$ $\frac{1}{2}-\frac{8}{7}=$

$\frac{5}{8}-\frac{7}{5}=$ $-\frac{5}{4}-\frac{1}{9}=$ $-\frac{3}{10}+\frac{7}{3}=$

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MULTIPLYING & DIVIDING FRACTIONS

Multiply or divide the fractions. Simplify your answer.

$\frac{5}{2} \cdot \frac{1}{2} =$

$\frac{1}{3} \cdot \frac{1}{3} =$

$\frac{1}{4} \cdot \frac{2}{4} =$

$-\frac{2}{5} \cdot \frac{3}{5} =$

$\frac{3}{6} \cdot -\frac{5}{6} =$

$-\frac{1}{4} \cdot -\frac{8}{7} =$

$4(\frac{5}{8}) =$

$-3(\frac{2}{3}) =$

$-2(\frac{4}{9}) =$

$\frac{1}{2} \div \frac{5}{4} =$

$\frac{2}{9} \div \frac{1}{3} =$

$\frac{1}{4} \div \frac{2}{5} =$

$-\frac{2}{3} \div \frac{1}{5} =$

$\frac{3}{6} \div -\frac{5}{4} =$

$-\frac{1}{2} \div -\frac{8}{7} =$

COMBINING LIKE TERMS

Combine like terms for each expression.

EXPRESSION	SIMPLIFIED
$x + x + 3x + y$	
$y + 2y + 5x + x$	
$5 + z + z + 4z - 6$	
$3x + 4x - 5$	
$5c + 2b - 3c$	
$x + y + 2x$	
$6a - 5b + a$	
$4 + 3x - 7 - 8x$	
$3(x + 2) - 4$	
$-5(x - 3) + 7x$	
$5m - 6n - 9m$	
$-8a - 9b - 10a + 9b$	
$2(x + 4) + 5x - 3$	
$-10(2 + x) - 3x$	

SOLVING ONE-STEP EQUATIONS

Solve the one-step equations.

$x + 7 = 9$

$5 + x = -3$

$6 = x + 8$

$x - 9 = 1$

$-5 + x = -2$

$4 = x - 7$

$5x = 75$

$-2x = -64$

$-7.5 = 1.25x$

$\frac{x}{4} = 7$

$-\frac{x}{2} = 8$

$-3 = -\frac{x}{9}$

$\frac{3}{4}x = 7$

$-\frac{1}{2}x = 8$

$-5 = -\frac{2}{9}x$

SOLVING TWO-STEP EQUATIONS

Solve the two-step equations. Leave your answer as a simplified fraction.

$2x + 7 = 9$

$5 + 4x = -3$

$6 = 2x + 8$

$4x - 9 = 1$

$-5 + 3x = -2$

$4 = -x - 7$

$5x + 10 = 75$

$-2x + 8 = -64$

$-7.5 = 1.25x + 2.5$

$\frac{x}{4} - 6 = 7$

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

$-3 = 8 - \frac{x}{9}$

$\frac{3}{4}x + 5 = 7$

$-\frac{1}{2}x - 4 = 8$

$-5 = -\frac{2}{9}x + 2$

RATIOS

Create the ratios for each situation.

To create a perfect fruit smoothie for you and your friends, you must use 5 strawberries, 9 blueberries, 1 banana, 4 slices of pineapple, and 3 slices of mango.

FRUIT	RATIO
strawberries to blueberries	
strawberries to pineapple	
pineapple to mango	
mango to banana	
banana to blueberries	
mango to blueberries	
pineapple to berries	
mango to the smoothie	
pineapple to the smoothie	
berries to the smoothie	
berries to non-berries	
smoothie to blueberries	
smoothie to mango	

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SOLVING PROPORTIONS

Solve each proportion. Leave your answer as a simplified fraction or decimal.

$\frac{x}{3} = \frac{4}{6}$ $\frac{6}{5} = \frac{x}{4}$ $\frac{3}{5} = \frac{6}{x}$

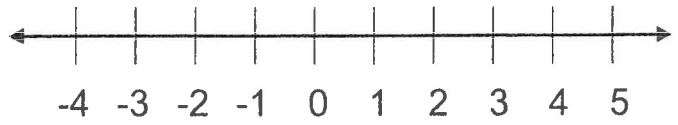
$\frac{x}{7} = \frac{1}{6}$ $\frac{6}{x} = \frac{2.5}{2}$ $\frac{4.5}{3} = \frac{9}{x}$

$\frac{x}{3} = \frac{4.2}{10}$ $\frac{11}{x} = \frac{2.5}{5.5}$ $\frac{6}{5} = \frac{12}{x}$

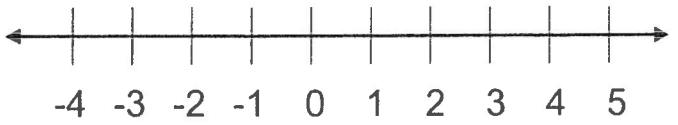
GRAPHING INEQUALITIES

Graph each inequality on the number line shown.

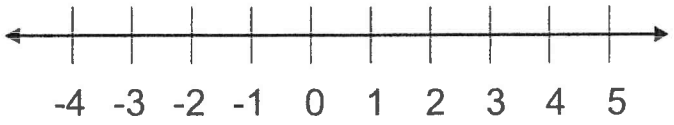
$x > 2$



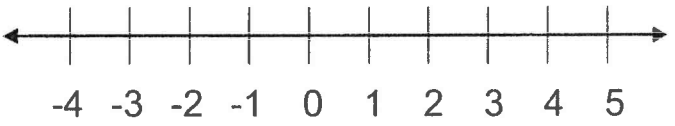
$x < -3$



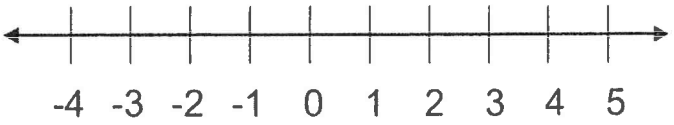
$x \geq -1$



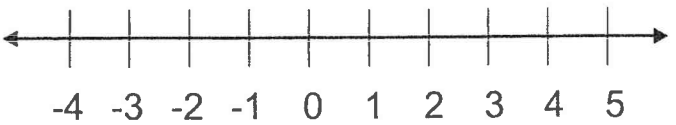
$x \leq 4$



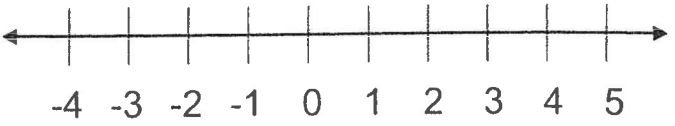
$x < 0$



$x \geq 0$



$x > -2$



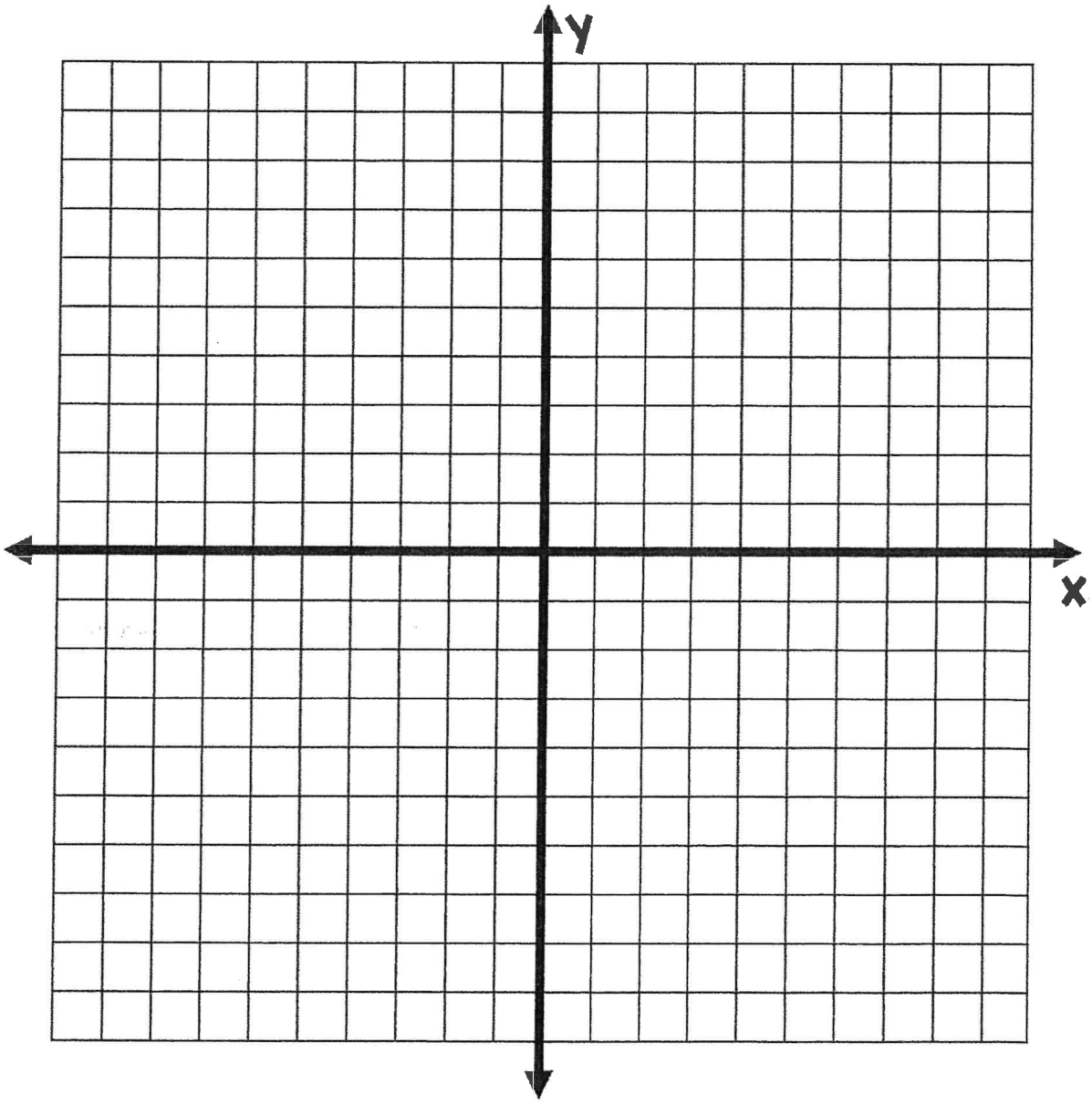
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THE COORDINATE PLANE

Plot each point on the coordinate plane and name the quadrant the point is in.

POINT	QUADRANT
A(3, 4)	
B(5, -7)	
C(0, -5)	
D(-9, 2)	

POINT	QUADRANT
E(-1, -2)	
F(-8, 0)	
G(10, 3)	
H(-4, 8)	

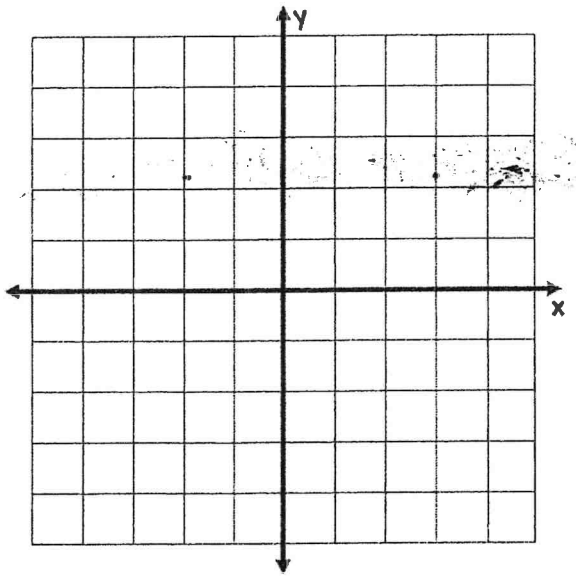


GRAPHING BY MAKING A TABLE

Graph the equations by using substitution to complete a table of values.

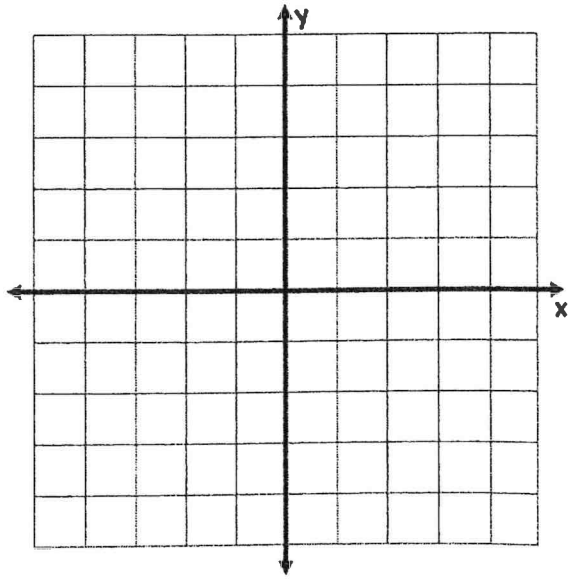
$y = x + 2$

x	y
-2	
-1	
0	
1	
2	



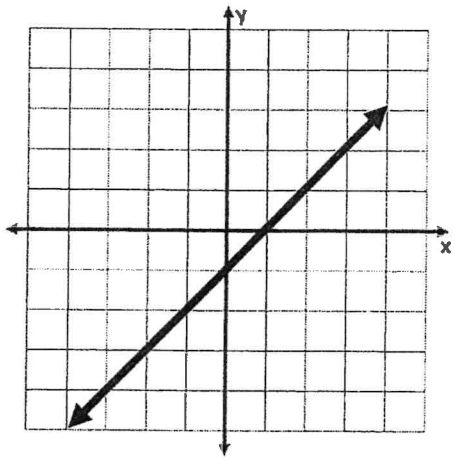
$y = 2x - 1$

x	y
-2	
-1	
0	
1	
2	

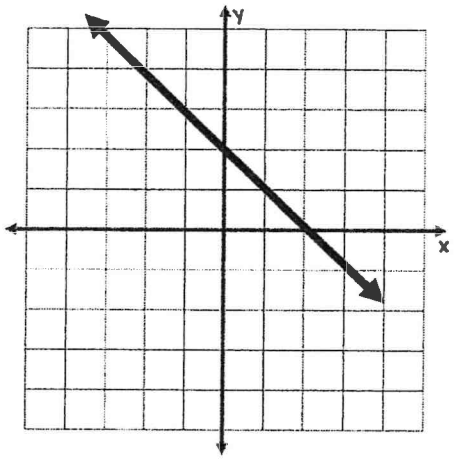


SLOPE & y-INTERCEPT

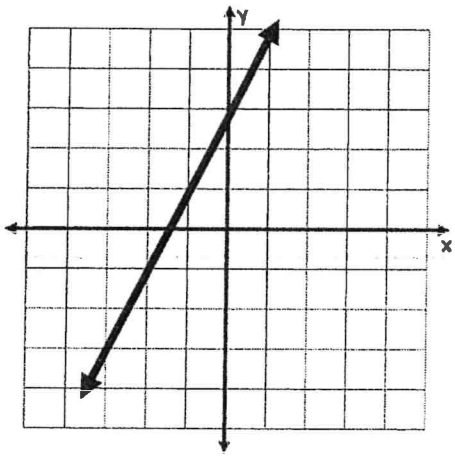
Determine the slope and the y-intercept of each graph.



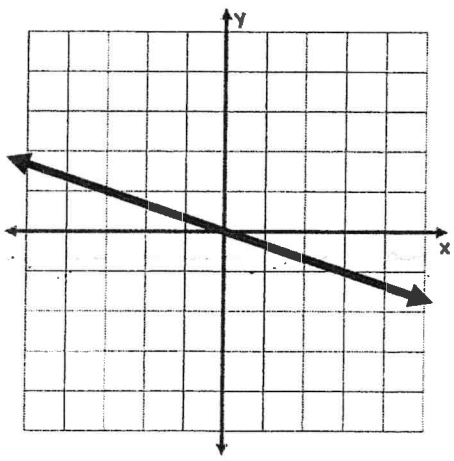
slope:	
y-intercept:	



slope:	
y-intercept:	



slope:	
y-intercept:	



slope:	
y-intercept:	

BASIC EXPONENT RULES

Simplify each expression using exponent rules.

EXPRESSION	SIMPLIFIED
$x \cdot x$	
$y \cdot y \cdot y \cdot y$	
$x \cdot x \cdot y \cdot y \cdot y$	
$y \cdot z \cdot z \cdot z \cdot z \cdot z$	
$x^2 \cdot x^3$	
$x^5 \cdot x^4$	
$y^6 \cdot y$	
$(x^4)^3$	
$(y^3)^2$	
$x^2 \cdot x \cdot y^3 \cdot y^4$	
$a^4 \cdot b^8 \cdot a^5 \cdot b^2$	
$c^3 \cdot d \cdot c^4 \cdot b$	
$\frac{x^5}{x^2}$	
$\frac{y^8}{y^3}$	

SEQUENCES & PATTERNS

Determine the pattern of each sequence and find the next 3 terms.

2, 4, 8, 16, 32, _____, _____, _____

5, 10, 15, 20, 25, _____, _____, _____

-5, -3, -1, 1, 3, _____, _____, _____

0.4, 0.2, 0, -0.2, -0.4, _____, _____, _____

3, -6, 12, -24, 48, _____, _____, _____

$\frac{3}{9}, \frac{4}{9}, \frac{5}{9}, \frac{6}{9}, \frac{7}{9}$, _____, _____, _____

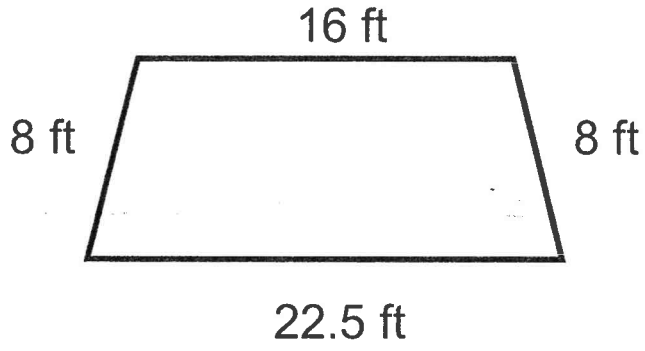
$\frac{1}{2}, \frac{1}{4}, \frac{1}{8}, \frac{1}{16}, \frac{1}{32}$, _____, _____, _____

6, -3, -12, -21, -30, _____, _____, _____

2, 5, 12.5, 31.25, 78.125, _____, _____, _____

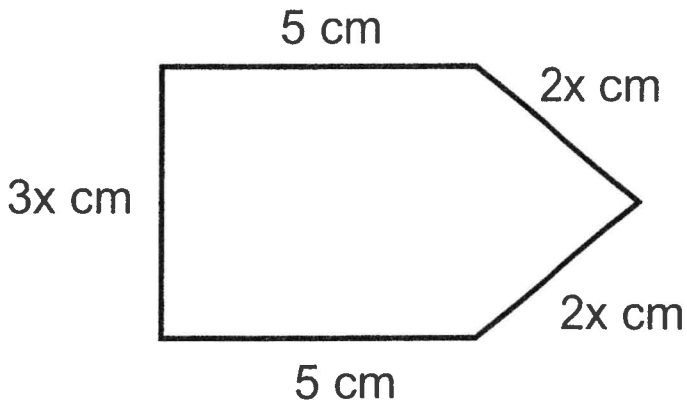
CALCULATING PERIMETER

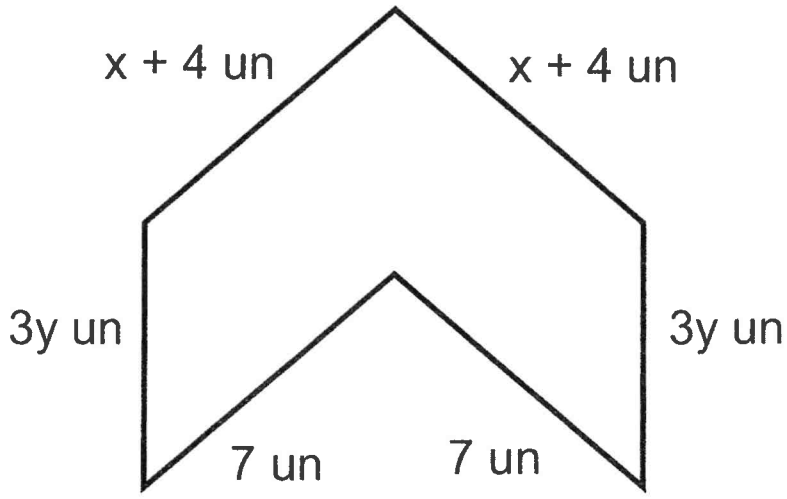
Determine the perimeter of each figure.



P =

P =

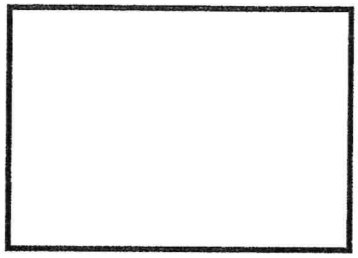




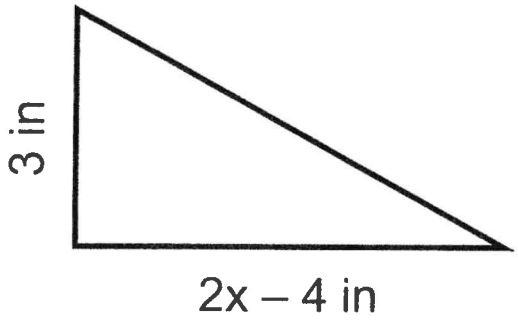
P =

CALCULATING AREA

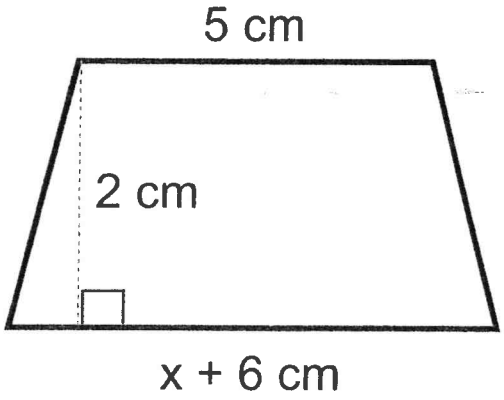
Determine the area of each figure.



A =



A =



A =

PERFECT SQUARE NUMBERS

Complete the perfect squares chart. Fill in as many as you can without a calculator.

$1^2 =$		$16^2 =$	
$2^2 =$		$17^2 =$	
$3^2 =$		$18^2 =$	
$4^2 =$		$19^2 =$	
$5^2 =$		$20^2 =$	
$6^2 =$		$21^2 =$	
$7^2 =$		$22^2 =$	
$8^2 =$		$23^2 =$	
$9^2 =$		$24^2 =$	
$10^2 =$		$25^2 =$	
$11^2 =$		$30^2 =$	
$12^2 =$		$40^2 =$	
$13^2 =$		$50^2 =$	
$14^2 =$		$60^2 =$	
$15^2 =$		$70^2 =$	