Algebra and Exponents: Chapter Test 1

1. Given that the solution to the expression $-5xy+(x-y)^2$ is 19, which of the following are possible values of x and y.

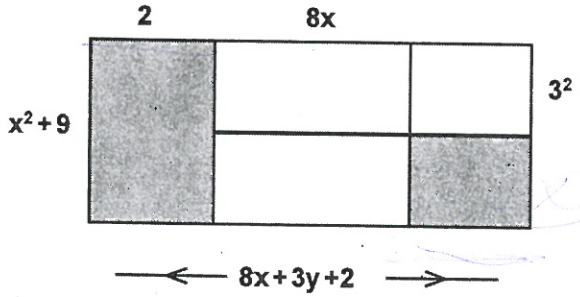
   a. $x=1 \quad y=-2$

   b. $x=-1 \quad y=2$

   c. $x=-1 \quad y=-2$

   d. $x=1 \quad y=2$

2. Which of the following represents the correct algebraic expression for the shaded area in the diagram below:



   a. $12x+5$

   b. $2x^2+4x+5$

   c. $3x^2y+2x^2+18$

   d. $7x^3+10x^2$

3. For each of the following terms identify its coefficient and its degree.

   a. $4x^2$

   b. $-7x^5y^2$

   c. $-xy^3z$

4. Perform each of the following operations and simplify or reduce the result when possible.

a. $(2)^3\left(\frac{1}{4}\right)^2 = ?$

b. $(-3x)^2\left(\frac{1}{6}\right) = ?$

c. $\left(-5^2\right)(-x)^2\left(\frac{1}{10}\right) = ?$

5. Perform the following operations and simplify the result.

a. $\frac{8x^2-12x}{4} - \frac{9x^2+6}{3} = ?$

b. $\frac{10x^2+25}{5} + (4x)(x) = ?$

6. Simplify these monomials by either multiplying or dividing.

a. $(4)(-2y)$

b. $-2a(-5ab)$

c. $x(3xy)$

d. $\frac{-15a}{-5}$

7. Simplify the following algebraic expressions.

a. $\dfrac{81-9x^2}{-3}=?$

b. $\dfrac{10x^2+5x}{5}=?$

c. $\dfrac{12x^2-6x+20}{2}=?$

d. $(-2x)(-10x)=?$

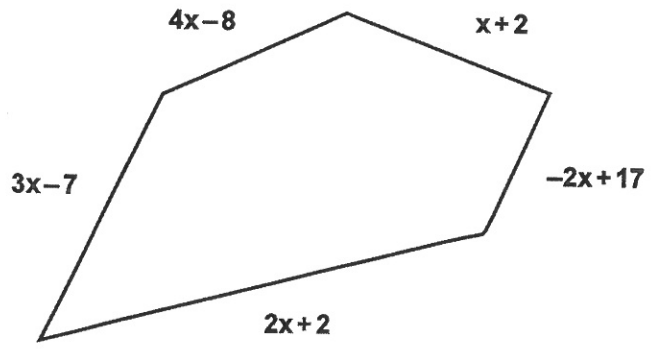
e. $4(6x^2-x+1)=?$

f. $3^2-5(2x+1)-7x(x)=?$

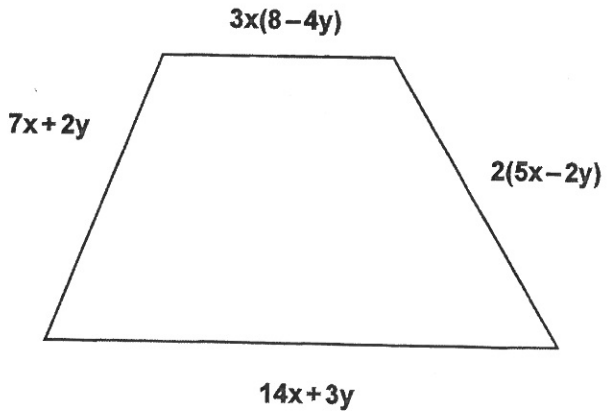
8. The life span of an elephant is equal to the age of a donkey, a tiger and a mouse put together. If the tiger's life span is five less than the square of the mouse's lifespan, and the donkey's life span is one less than double the tiger's, give the algebraic expression for the life span of the elephant.

9. Find the algebraic expression for the perimeter of each of the following shapes:

a.



b.



1. Which of the following is the correct matching of the column A statement with column B value?

a. 1g– 2a– 3f– 4c– 5h

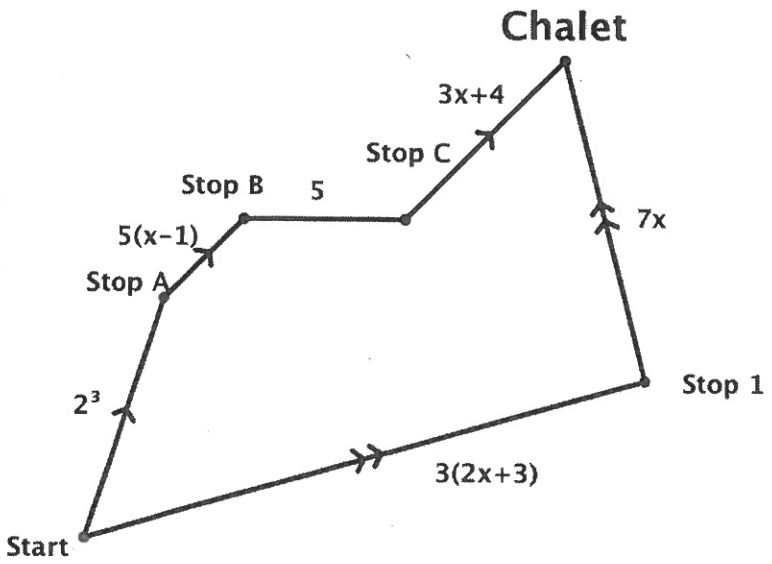
b. 1d– 2b– 3c– 4e– 5d

c. 1e– 2b– 3h– 4c– 5h

d. 1d– 2a– 3f– 4e– 5d

Column A	Column B
1. The coefficient of this term $-2xy^{-3}$ is	a. 1
	b. 0
2. The answer to $(100a)^0$ is	c. 8
	d. –3
3. The numerical value for the expression $2^y z^2$ if $y=2, z=1$	e. 7
	f. 4
4. The degree of the expression $10a^7b$	g. –2
5. The exponent for 27 as a power of 3	h. 3

2. What algebraic expression can be used to represent the difference in distance travelled by a cross–country skier taking the route through stops A, B and C instead of the route through stop 1 to get to the chalet as shown in the diagram below:



a. $25x+21$

b. $5x+5$

c. $5x-3$

d. 25

3. Evaluate the expression $7(-xy^2)+4xy$, if $x=-1$ and $y=2$.

4. Perform the following operations and simplify the result.

   a. $5x-7y-10y+3x+2y=?$

   b. $3a^2-6a+11a-7a^2=?$

   c. $(9x-4y)-(8x+2y)=?$

5. Simplify these monomials by either multiplying or dividing.

   a. $(5)(-2x^2)=?$

   b. $(3x)(-x)=?$

   c. $(-5x)(-3x)=?$

   d. $2^5 \div 2=?$

   e. $\dfrac{2x^2}{-2}=?$

6. Perform the following operations and simplify the result.

   a. $\dfrac{24x^2-2x+6}{2}=?$

   b. $\dfrac{9x-12x^2}{3}=?$

   c. $5x(x+3)=?$

   d. $3(1-x)+5^0-\dfrac{14x}{2}=?$

7. The weight of a person would be different if they lived on other places in our solar system. Give the algebraic expression for the weight of a person on each of the following places based on its comparison to the weight on Earth.

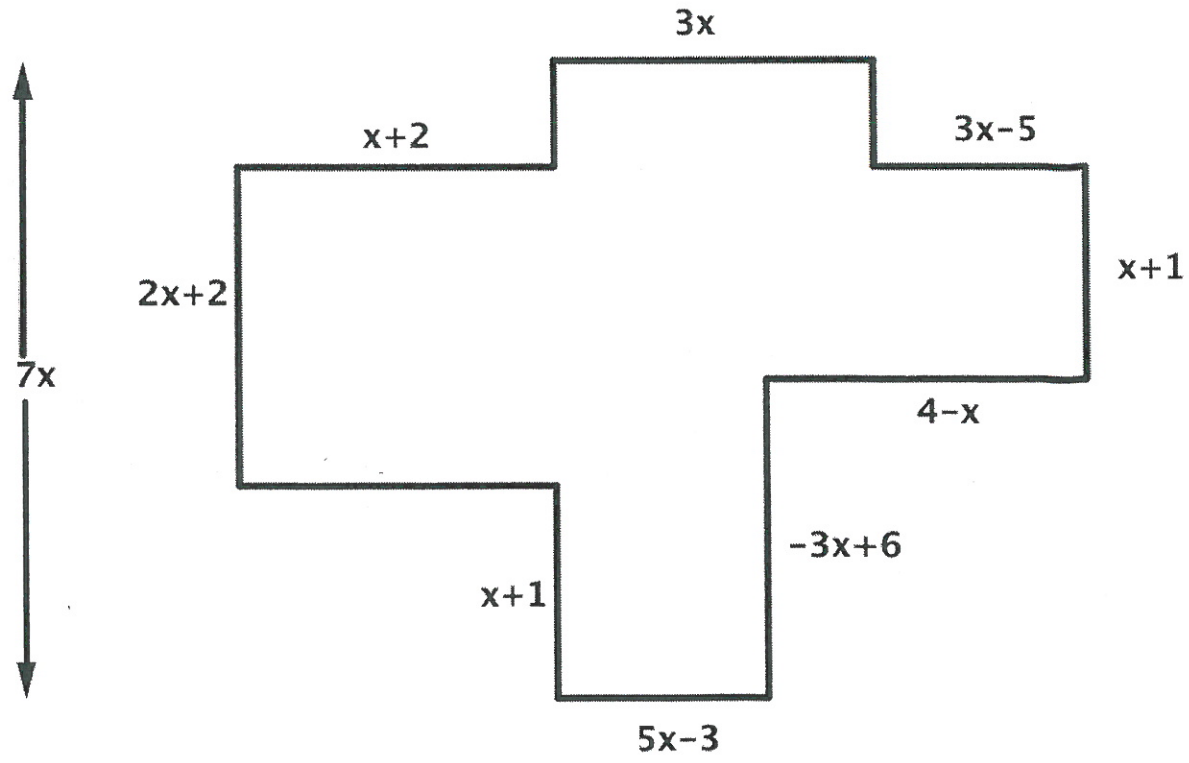
   a. A person's weight on the Moon is 33 less than one half of the weight on Earth.

   b. On Jupiter the weight is twice the weight on Earth plus 36.

   c. On the Sun you would find a person's weight by squaring the weight on Earth and then dividing by 4.

8. A rectangle is $3y$ cm wide by $8x$ cm long. Find the algebraic expression to define the perimeter of a second triangle if its width is 4 less than three times that of the first rectangle, and its length is the square of the first.

9. Given the following shape:

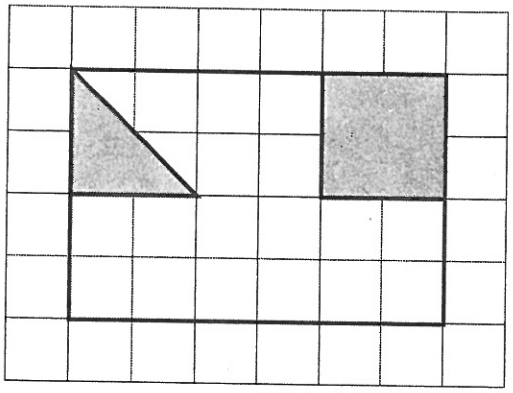


   a. Find the algebraic expression for its perimeter

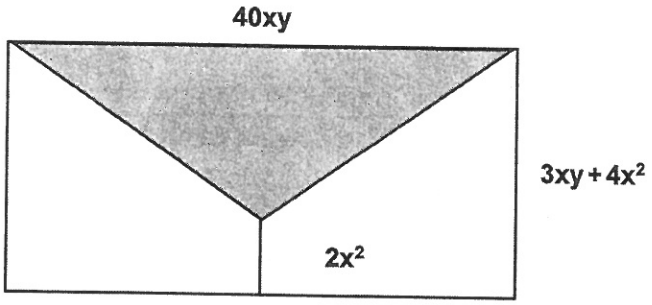
   b. Find the numerical value of the perimeter if x = 2.

10. Find the algebraic expression for the shaded area for each of the following shapes.

a. Given that each block is $3x$ by $3x$



b.



Extension

11. Start with the expression $5x$

a. Multiply by $-2y$

b. Add $2x(3y-x)$

c. Divide by -2

d. Add $4x-2xy$

e. Subtract x^2

What operation would you do next to get your original number of $5x$?

12. The term algebra means the reunion of broken parts. What is the Arabic word from which algebra was derived? Solve the following puzzle by simplifying each expression, finding the letter that matches it and placing the letters in the spaces below.

i. $(xy^2)(y^3z)$

ii. 4^{-2}

iii. $\dfrac{mn^3}{mn}$

iv. $\dfrac{x^4y^6z^2}{x^3yz}$

v. $5(x-3)+2^2-7x$

vi. $3y(y^2-7)$

xy^5z	$-2x-11$	$\frac{1}{8}$	64	5^3	$2x^7$	$3y(y^2-7)$	x^2	mn^2
A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**
n^2	5^2	$\left(\frac{1}{16}\right)$	$\frac{4}{5}$	$4(2-x)-x-3$	$\frac{25}{16}$	$\frac{2}{3}$	$12x-11$	$3y^3-21y$
J	**K**	**L**	**M**	**N**	**O**	**P**	**Q**	**R**

What is the Arabic word from which algebra was derived?

____ ____ ____ ____ ____ ____

i. ii. iii. iv. v. vi.