SOLUTIONS

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.

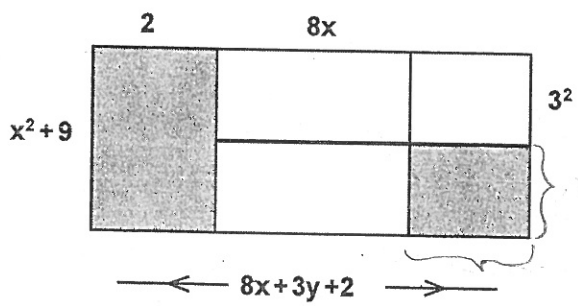
   a. $x=1 \quad y=-2$

   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:



Area = l×w
Area = (2)(x²+9)
= 2x²+18

x²+9−9
x²

8x+3y+2−(2+8x)
8x + 3y + 2 − 2 − 8x
3y

   a. $12x+5$

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

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

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

Area = l×w
= (x²)(3y)
= 3x²y

Total area = 2x² + 18 + 3x²y

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

   a. $4x^2$ c = 4 d = 2

   b. $-7x^5y^2$ c = −7 d = 7

   c. $-xy^3z$ c = −1 d = 5

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

a. $(2)^3\left(\frac{1}{4}\right)^2 = ?$ $(8)\left(\frac{1}{16}\right) = \frac{8}{16} = \frac{1}{2}$

b. $(-3x)^2\left(\frac{1}{6}\right) = ?$ $(9x^2)\left(\frac{1}{6}\right) = \frac{9x^2}{6} = \frac{3x^2}{2}$

c. $(-5^2)(-x)^2\left(\frac{1}{10}\right) = ?$ $(-25)(x^2)\left(\frac{1}{10}\right) = \frac{-25x^2}{10} = -\frac{5x^2}{2}$

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. $(4)(-2y)$ $= -8y$

b. $-2a(-5ab)$ $= 10a^2b$

c. $x(3xy)$ $= 3x^2y$

d. $\frac{-15a}{-5}$ $= 3a$

(8)

Elephant's age = donkey + tiger + mouse

mouse's age = x

Tiger = $x^2 - 5$

Donkey = $2(x^2 - 5) - 1 = 2x^2 - 10 - 1$
$= 2x^2 - 11$

Elephant = $x + (x^2 - 5) + (2(x^2 - 5) - 1)$

$= x + x^2 - 5 + 2x^2 - 11$

$= 3x^2 + x - 16$

(9) a

$P = (4x - 8) + (x + 2) + (-2x + 17) + (2x + 2) + (3x -$

$= 4x - 8 + x + 2 - 2x + 17 + 2x + 2 + 3x - 7$

$= 8x + 6$

b

$P = [3x(8 - 4y)] + [2(5x - 2y)] + (14x + 3y) + (7x + 2$

$= (24x - 12xy) + (10x - 4y) + (14x + 3y) + (7x + 2$

$= 24x - 12xy + 10x - 4y + 14x + 3y + 7x + 2y$

$= 55x + y - 12xy$

7. Simplify the following algebraic expressions.

a. $\dfrac{81-9x^2}{-3}=?$ $\quad \dfrac{81}{-3} - \dfrac{9x^2}{-3} = -27 - -3x^2$

$= -27 + 3x^2$

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

c. $\dfrac{12x^2-6x+20}{2}=?$ $\quad \dfrac{12x^2}{2} - \dfrac{6x}{2} + \dfrac{20}{2} = 6x^2 - 3x + 10$

d. $(-2x)(-10x)=?$ $\quad 20x^2$

e. $4(6x^2-x+1)=?$ $\quad 24x^2 - 4x + 4$

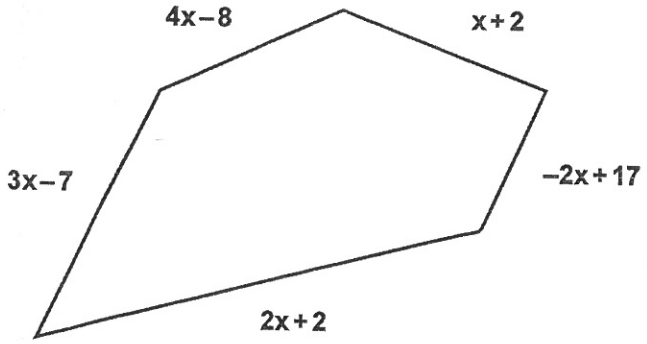
f. $3^2-5(2x+1)-7x(x)=?$ $\quad 9 - 10x - 5 - 7x^2$

$4 - 10x - 7x^2$

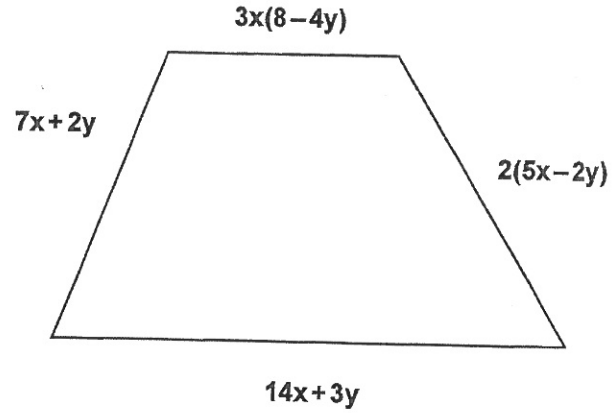
8. The life span of an elephant is equal to the age of a donkey, a tiger and a mouse put together. If the tiger's life span is five less than the square of the mouse's lifespan, and the donkey's life span is one less than double the tiger's, give the algebraic expression for the life span of the elephant.

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

a.



b.



5 a

$$\frac{8x^2-12}{4} - \frac{9x^2+6}{3} \qquad CD = 12$$

$$= \frac{3(8x^2-12)}{12} - \frac{4(9x^2+6)}{12}$$

$$= \frac{24x^2-36}{12} - \frac{36x^2+24}{12}$$

$$= \frac{(24x^2-36)-(36x^2+24)}{12}$$

$$= \frac{24x^2-36-36x^2+24}{12}$$

$$= \frac{-12x^2-12}{12}$$

$$= \frac{-12x^2}{12} - \frac{12}{12}$$

$$= -x^2 - 1$$

b.

$$\frac{10x^2+25}{5} + (4x)(x)$$

$$= \frac{10x^2+25}{5} + 4x^2$$

$$= 2x^2 + 5 + 4x^2$$

$$= 6x^2 + 5$$