WORKSHEET 3 FURTHER ALGEBRA - CHAPTER 13

WHAT DID ONE LION SAY TO ANOTHER WHILE EATING A CLOWN?

1 Write an algebraic expression to represent each of these numbers.
(a) 6 more than x.   (b) k less than 6   (c) t more than 3

2 Write an algebraic expression in its simplest form to represent these products.
(a) $\frac{3}{4} \times t$ (b) $a \times \frac{5}{4}$ (c) $x \times \frac{3}{5}$

3 Find the value of the following expressions for the given value of the pronumeral.
(a) $4 + 5a$ if $a = 3$ (b) $9 - 2x$ if $x = 3$ (c) $8 + 7t$ if $t = 4$

4 Write an algebraic expression in its simplest form to represent these products.
(a) $x \times 2\frac{1}{2}$ (b) $y \times 3\frac{2}{3}$ (c) $2\frac{2}{3} \times t$

5 (a) I think of a number n. I divide it by 5. Now I subtract 3. Write an expression for the result in terms of n

(b) I own 5 films on DVD and then I spend $\$y$ at the video store to hire some more DVDs at $5 each. How many DVDs do I now have to choose from?

(c) My brother is 4 years older than I am. I am 2 years younger than my sister. If my brother is x years old now, how old will my sister be next year?

6 Evaluate these expressions for the given values of the pronumerals.
(a) $3xy$ if $x = 2; y = 6$

(b) $6xyz$ if $x = \frac{1}{3}; y = \frac{1}{2}; z = 9$

(c) $3m^2n$ if $m = 4; n = 5$

7 Write these expressions without the brackets.
(a) $(x^4y^5)^2$ (b) $(3y^2)^3$ (c) $(2a^3b^5)^4$

8 Expand these brackets.
(a) $-4(3x + 5)$ (b) $-3(3x - 1)$ (c) $-8\left(\frac{3}{4}y - 2\right)$

9 Find the value of these expressions for the given value of the pronumeral.
(a) Find $(2x + 3)$ when $x = -1$; $x = -2$; $x = -10$
(b) Find $(3y - 5)$ when $y = -1$; $y = -2$; $y = -6$
(c) Find $(-4 + k)$ when $k = -5$; $k = -3$; $k = -7$

10 Expand these brackets.
(a) $2k(3k + 1)$ (b) $3f^2(2f + 3) =$ (c) $6p^3(2p^2 + p) =$

11 Cancel the following fractions to their lowest terms.

(a) $\dfrac{30fg}{5f}$

(b) $\dfrac{25x^3y}{20xy^2}$

(c) $\dfrac{15ax}{5ax^2}$

12 Factorise the following by taking out the common factor.

(a) $3t^2 + 12t$

(b) $8at^3 + 6a^2t$

(c) $36b^4 - 24b^2$

13 Cancel down these fractions where possible, by first factorising the numerator.

(a) $\dfrac{3xy + 6ay}{3y}$

(b) $\dfrac{25kt - 35k^2t}{5kt}$

(c) $\dfrac{15ba^3 + 10ba}{5ba}$

14 By substituting x= 1 into these expressions, state which two are equivalent.

A $x^3 + 1$ B $(x+1)(x^2 - x + 1)$ C $(x+1)(x^2 + x + 1)$

15 Solve the following equations.

(a) $2t - 18 = 24$ (b) $3x+2 = 71$ (c) $5k - 12 = 48$

16 On my bookshelves in the study I can fit a certain number of books on each shelf as well as 24 on top with bookends. If I have 8 shelves and 216 books, how many books do I fit on each shelf? Form an equation and solve it to answer this question.

Answers:

A	C	D	E	F	H	I	K	N
19 3 36	$x+6$ $3-k$ $3+t$	$-12x-20$ $-9x-3$ $-6y+16$	x^8y^{10} $27y^6$ $16a^{12}b^{20}$	$3t(t+4)$ $2at(4t^2+3a)$ $12b^2(3b^2-2)$	$\dfrac{n}{5}-3$ $\dfrac{y}{5}+5$ $x-1$	36 9 240	$6k^2+2k$ $6f^3+9f^2$ $12p^5+6p^4$	A and B

R	S	T	U	W	Y	O
$1,-1,-17$ $-8,-11,-23$ $-9,-7,-11$	$6g$ $\dfrac{5x^2}{4y}$ $\dfrac{3}{x}$	$\dfrac{3t}{4},\dfrac{5a}{4},\dfrac{3x}{5}$	$t=21$ $x=21$ $k=12$	$x+2a$ $5-7k$ $3a^2+2$	$\dfrac{5x}{2},\dfrac{11y}{3},\dfrac{8t}{3}$	$8x+24=216$

$\overline{13}\ \overline{5}\ \overline{3}\ \overline{2}\quad \overline{8}\ \overline{16}\quad \overline{4}\ \overline{16}\ \overline{15}\quad \overline{9}\ \overline{7}\ \overline{1}\ \overline{10}\ \overline{16}\ \overline{14}^?$

$\overline{8}\ \overline{16}\ \overline{7}\ \overline{11}\quad \overline{2}\ \overline{5}\ \overline{6}\ \overline{11}\quad \overline{2}\ \overline{3}\ \overline{11}\ \overline{2}\ \overline{7}\quad \overline{12}\ \overline{15}\ \overline{14}\ \overline{14}\ \overline{4}\quad \overline{2}\ \overline{16}\quad \overline{4}\ \overline{16}\ \overline{15}.$