Polynomials Review

A. True or false?

1) $a^4 + 16 = (a + 2)^4$
2) $2^n \times 3^2 = 6^{n+2}$
3) $x^0 = 1$
4) $(-x)^{12} = -x^{12}$

B. Simplify.

1) $-2^4 + 2^3 - 2^2$
2) $(2 - 3^2) - (2 - 3^2)^2 + (2 - 3^2)$

C. Evaluate for $x = 2$ and $y = -2$.

1) $x^2 - 2y^2$
2) $(x - 2y)^2$

D. Simplify.

1) $(3x + 2)(3x - 2)$
2) $(4x - 3)^2$
3) $2^3 \cdot 3^2$
4) $-(3x^2y)^2$
5) $2n^2(n + 1) - (2n)(n^2 - 3n)$
6) $(-3m^2)^3 + (3m^3)(m^3)$
7) $(3x^2y^4z)(-2xyz^3)$
8) $(3a^2bc)^3(3ab^2c)$
9) $\dfrac{15x^4y^3z^5}{10x^4y^5z^2}$
10) $(x^2 + 3x - 5) + (3x^2 - 3x - 1)$
11) $(2x^3)^2(-3xy)^2$
12) $(2a + b^2)(3ab - 2)$
13) $(-3x^2y)^2$
14) $-2(x^2 - 3x + 2)$
15) $(2x - 8)(4x + 3)$
16) $(3x - 4y) - (6y - 8z) + (x + 2z)$
17) $(3^{2x})(3^{1-2x})$
18) $\dfrac{(-16x^2yz)^3}{(16x^3yz)^4}$

E. Solve for the indicated variable.

1) $E = C(R + r)$, for C
2) $E = C(R + r)$, for R

F. Word problems. If the problem has no solution, give a brief explanation.

1) Two jets leave the airport simultaneously at noon. One travels west at 600 $^{km}/_{h}$ and the other east at 750 $^{km}/_{h}$. At what time will they be 3375 km apart?

2) Mack is eight years older than Zack. In five years he will be five times as old as Zack. How old is Zack now?

3) It took Mel 1 hour to drive to work. It took her only 45 minutes to drive back home, because she drove 16 $^{km}/_{h}$ faster. How far from work does she live?

4) A square swimming pool is surrounded by a uniform walkway that is 1 m wide. If

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the area of the walkway is 52 m^2, find the dimensions of the pool.

SOLUTIONS

A: (1) False: $(a + 2)^4 = a^4 + 8a^3 + 24a^2 + 32a + 16$ (2) False: $2^n \times 3^2 = 2^n \times 9$
(3) True (4) False: $(-x)^{12} = (-1 \cdot x)^{12} = (-1)^{12} \cdot x^{12} = 1 \cdot x^{12} = x^{12}$

B: (1) −12 (2) −63

C: (1) −4 (2) 36

D: (1) $9x^2 - 4$ (2) $16x^2 - 24x + 9$ (3) 72 (4) $-9x^4y^2$ (5) $8n^2$ (6) $-24m^6$
(7) $-6x^3y^5z^4$ (8) $81a^7b^5c^4$ (9) $3z^3/2y^2$ (10) $4x^2 - 6$ (11) $36x^8y^2$
(12) $6a^2b + 3ab^3 - 4a - 2b^2$ [The order of these terms isn't important.]
(13) $9x^4y^2$ (14) $-2x^2 + 6x - 4$ (15) $8x^2 - 26x - 24$ (16) $4x - 10y + 10z$
(17) 3 (18) $-\dfrac{1}{16x^6yz}$

E: (1) $C = \dfrac{E}{R + r}$ (2) $R = \dfrac{E}{C} - r$ *or* $R = \dfrac{E - Cr}{C}$

F: (1) 2:30 pm: Let x represent the time that has elapsed.

	d =	r ×	t
westbound	600x	600	x
eastbound	750x	750	x

600x + 750x = 3375
x = 2.5 = 2 h 30 min
12:00 noon + 2:30 = 2:30 pm

(2) There is no solution: Let x represent Zack's age now.

	now	in 5 yrs
Mack	x + 8	x + 13
Zack	x	x + 5

(x + 13) = 5(x + 5)
−4x = 12
x = −3

Since it's not possible to have negative ages, there is no solution.

(3) 48 km: Let x represent Mel's speed going to work.

	d =	r ×	t
to work	1 · x	x	1 h
from work	.75x + 12	x +16	.75 h

x = .75x + 12
4x = 3x + 48
x = 48

(4) 12 m × 12 m: Let x represent the length of the pool.
The total area is the pool and walkway.
$(x + 2)^2 = x^2 + 52$
$x^2 + 4x + 4 = x^2 + 52$
4x = 48; x = 12