

SOL Warm-Up
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A.2a (a) Using laws of exponents to simplify monomial expressions and ratios of monomial expressions

1. Which expression is equivalent to $(5x^2)(4x^5)$?

- A** $9x^7$
- B** $9x^{10}$
- C** $20x^7$
- D** $20x^{10}$

2. Which expression is equivalent to $(12x^8)(-4x^2)$?

- A** $-48x^{10}$
- B** $-48x^{16}$
- C** $8x^{10}$
- D** $8x^{16}$

3. Which expression is equivalent to $(4x^2)^3$?

- A** $12x^5$
- B** $12x^6$
- C** $64x^5$
- D** $64x^6$

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A.2a (b) Using the laws of exponents to simplify monomial expressions and ratios of monomial expressions

1. Which expression is equivalent to $(-x^2)^3$?

A $-x^5$

B x^6

C $-x^6$

D $-3x^5$

2. Which expression is equivalent to $-\frac{2n^2}{n}$?

A $-\frac{2}{n}$

B $-2n$

C $\frac{2n}{n}$

D $-\frac{2n}{n}$

3. Which expression is equivalent to $\frac{3x}{5x^3}$?

A $\frac{3x^2}{5}$

B $\frac{3}{5x^2}$

C $\frac{3x}{5}$

D $\frac{3}{5x}$

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A.2a (c) Using the laws of exponents to simplify ratios of monomial expressions

1. Which expression is equivalent to $x^{12} \div x^3$?

A x^4

B x^9

C x^{15}

D x^{36}

2. Which expression is equivalent to $x^{15} \div x^{13}$?

A x

B x^2

C x^{28}

D x^{195}

3. Which expression is equivalent to $12x^{10} \div 3x$?

A $9x^9$

B $9x^{10}$

C $4x^9$

D $4x^{310}$

4. Which expression is equivalent to $36x^8 \div 9x^7$?

A $4x$

B x^{15}

C 4

D $4x^{15}$

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SN (a) Expressing numbers in scientific notation

1. Which expression represents 238.42 in scientific notation?

- A** 2.3842×10^5
- B** 2.3842×10^4
- C** 2.3842×10^3
- D** 2.3842×10^2

2. Which expression represents 0.000362 in scientific notation?

- A** 3.62×10^{-6}
- B** 3.62×10^{-5}
- C** 3.62×10^{-4}
- D** 3.62×10^{-3}

3. Which expression represents 0.783 in scientific notation?

- A** 7.83×10^{-2}
- B** 7.83×10^{-1}
- C** 7.83×10^1
- D** 7.83×10^2

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SN (b) Expressing numbers in scientific notation and performing operations

1. Which expression represents 348,000 in scientific notation?

- A** 3.48×10^4
- B** 3.48×10^5
- C** 3.48×10^6
- D** 3.48×10^7

2. Which expression represents the product of 0.000008 and 3,500,000?

- A** 11.5×10^3
- B** 2.8×10^1
- C** 2.8×10^4
- D** 28×10^4

3. Which expression represents the product of (4.63×10^8) and 500?

- A** 2.315×10^4
- B** 2.315×10^6
- C** 2.315×10^{11}
- D** 2.315×10^{16}

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A.2b (a) Finding the sum and difference of polynomials

1. $(4x - 2y) + (-2x + 6y) = \underline{\hspace{2cm}}$

- A** $2x + 4y$
- B** $-2x + 10y$
- C** $-2x - 10y$
- D** $6x + 8y$

2. $(3m - 6n) + (2m + n) = \underline{\hspace{2cm}}$

- A** $5m - 5n$
- B** $-4m + n$
- C** $m - 7n$
- D** $2m - 5n$

3. $(7x^2 + 8x - 4) - (6x^2 + 8x - 6) = \underline{\hspace{2cm}}$

- A** $x^2 - 10$
- B** $x^2 + 2$
- C** $13x^2 + 16x - 10$
- D** $13x^2 + 2$

4. $(15m + 11 - 6m^2) - (18 - 6m^2 + m) = \underline{\hspace{2cm}}$

- A** $7 + 21m - 7m^2$
- B** $12m^2 + 16m - 7$
- C** $14m - 7$
- D** $14m + 29$

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A.2b (b) Using polynomial operations to solve problems

1. A local fast food chain had revenue represented by the polynomial $6x^2 + 5x - 8$ for one fiscal year and expenses for that same fiscal year represented by the polynomial $4x^2 - 3x + 7$. What was the company's profit for the fiscal year?

- A** $10x^2 + 2x - 1$
B $2x^2 + 8x - 15$
C $2x^2 + 2x - 1$
D $2x^2 - 8x + 15$

2. Sherry owned a card shop and an art store. The card shop profits for 1998 are represented by the polynomial $3x^2 + 5x + 8$. The art shop however had losses for 1998 represented by the polynomial $2x^2 - 8$. Which polynomial represents the total amount Sherry made in 1998?

- A** $5x^2 + 5x$
B $x^2 + 5x$
C $x^2 + 5x + 16$
D $x^2 - 5x - 16$

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A.2b (c) Multiplying polynomials by a monomial

1. What is the product $2a(4a^2 + 6)$?

A $8a^3 + 8a$

B $8a^3 + 12$

C $8a^3 + 6$

D $8a^3 + 12a$

2. What is the product $2m^2(5m^2 - 6m + 2)$?

A $10m^4 - 6m + 2$

B $10m^2 - 12m^3 + 4m^2$

C $10m^4 - 12m^3 + 4m^2$

D $10m^4 - 12m^3 + 2$

3. What is the product $-3xy(3x^2y + 2xy^2 - 7y^3)$?

A $-9x^3y^2 - 6x^2y^3 + 21xy^4$

B $-9x^3y^2 + 2xy^2 - 7y^3$

C $-9x^3y^2 - 6x^2y^3 - 7y^3$

D $-9x^2y + 6x^2y^3 - 21xy^4$

4. A triangle has a height of $4x$ and a base of $3x + 1$. What is the area of the triangle? $A = \frac{1}{2}bh$

A $12x^2 + 4x$

B $6x^2 + 2x$

C $7x + 1$

D $5x + 1$

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A.2b (d) Multiplying binomials by binomials

1. What is the product $(4x - 3)(x + 4)$?

- A $4x^2 + 8x - 12$
- B $4x^2 + 13x - 12$
- C $4x^2 + 16x - 12$
- D $4x^2 + 13x + 12$

2. What is the product $(x + 3)(5x - 2)$?

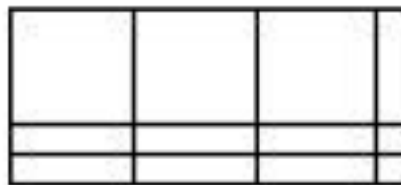
- A $5x^2 + 13x - 6$
- B $5x^2 + 15x - 6$
- C $5x^2 + 17x - 6$
- D $5x^2 + 15x + 1$

3. What is the product $(3x - 2)^2$?

- A $9x^2 - 4$
- B $9x^2 + 4$
- C $9x^2 - 12x - 4$
- D $9x^2 - 12x + 4$

4. The trinomial $3x^2 + 7x + 2$ is depicted below using algebra tiles.
What are the factors of the trinomial?

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



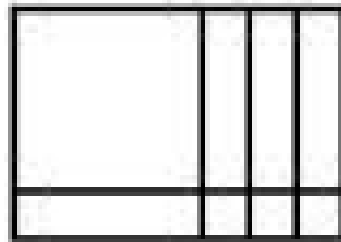
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A.2b (e) Using polynomial operations to solve problems

1. What is the area of a square with a side of length $3x - 1$?
A $6x^2 - 1$
B $9x^2 - 1$
C $9x^2 + 1$
D $9x^2 - 6x + 1$

2. A rectangle's length is $5x - 2$ and width $2x - 1$. What is the area of the rectangle?
A $7x^2 - 3$
B $10x^2 - 7x + 2$
C $10x^2 + 7x - 2$
D $10x^2 - 9x + 2$

3. A rectangle with area $x^2 + 4x + 3$ is depicted below using algebra tiles. What are the dimensions of the rectangle in terms of x ?
A $(x + 3)$ by $(x + 1)$
B $(3x + 1)$ by $(x + 1)$
C $(x + 3)$ by $(x + 3)$
D $(3x + 1)$ by $(3x + 1)$



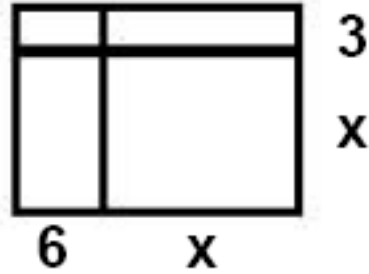
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A.2b (f) Using polynomial operations to solve problems

1. Which polynomial describes the area of the rectangle shown below?

- A $18x^2$
- B $2x + 9$
- C $x^2 + 9x + 18$
- D $x^2 + 3x + 18$



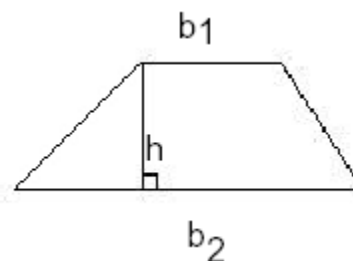
2. The side of a square is represented by the binomial $2x + 5$. Which polynomial represents the area of the square?

- A $4x^2 - 3$
- B $4x + 10$
- C $4x^2 + 20x + 25$
- D $4x^2 + 10$

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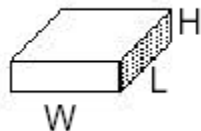
A.2b (g) Using operations with polynomials to solve problems

1. The formula for the area of the trapezoid is $A = \frac{1}{2} h(b_1 + b_2)$.
If $h = 4x$, $b_1 = x^2 + 2$ and $b_2 = 3x^2 + 2x - 4$, which polynomial represents the area of the trapezoid?



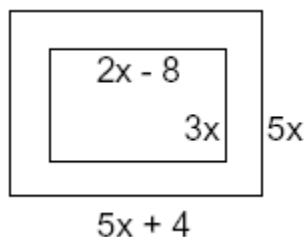
- A** $16x^3 + 8x^2 - 8x$
B $8x^3 + 8x^2 - 6x$
C $8x^3 + 4x^2 - 4x$
D $6x^5 + 4x^4 + 4x^3 + 8x^2 - 16x$

2. The formula for the volume of the rectangular solid is $A = lwh$. Assume the following rectangular solid shown below has a square base. The side of the base is represented by the polynomial $(x + 2)$ and the height of the solid is represented by the polynomial $(3x)$. Which polynomial represents the volume?



- A** $3x^2 + 6x$
B $3x^3 + 12x^2 + 12x$
C $3x^3 + 12x$
D $6x^2 + 12x$

3. The diagram below shows a swimming pool surrounded by a wooden deck. Which polynomial represents the area of the deck?



- A** $25x^2 + 20x$
B $6x^3 - 24x$
C $19x^2 - 4x$
D $19x^2 + 44x$

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A.2b (h) Using laws of exponents to find the quotient of polynomials

1. What is the quotient $(15x^4 - 9x^2) \div 3x$?

A $12x^3 - 6x$

B $5x^3 - 6x$

C $5x^3 - 3x^2$

D $5x^3 - 3x$

2. What is the quotient $(28x^5 + 20x^3 - 8x) \div 2x$?

A $26x^4 + 18x^2 - 6$

B $14x^4 + 10x^2 - 4$

C $26x^4 + 18x^2 - 6x$

D $14x^4 + 10x^2 - 4x$

3. What is the quotient $(30x^6 + 20x^4 + 10x^2) \div 10x^2$?

A $20x^8 + 10x^6 + x^4$

B $20x^4 + 10x^2 + 10$

C $3x^8 + 2x^6 + x^4$

D $3x^4 + 2x^2 + 1$

4. What is the quotient $(45x^8 - 27x^6 + 18x^4) \div 9x^2$?

A $5x^6 - 3x^4 + 2x^2$

B $5x^{10} - 3x^8 + 2x^6$

C $36x^6 - 18x^4 + 9x^2$

D $36x^{10} - 18x^8 + 9x^6$