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Master 5.19

Extra Practice 1

Lesson 5.1: Modelling Polynomials

1. Identify the polynomials in the following expressions.

a) $2m^2 + 1$ **b)** $3x^{\frac{1}{2}}$ **c)** $-4x$ **d)** $\frac{1}{x^2 + x}$ **e)** $0.25y^2$

2. Name the coefficients, variable, degree, and constant term of each polynomial.

a) $-8y$ **b)** 12 **c)** $-2b^2 - b + 10$ **d)** $-4 - b$

3. Identify each polynomial as a monomial, binomial, or trinomial.

a) $19t$ **b)** $g - 4g^2 + 5$ **c)** $-1 + xy + y^2$ **d)** $4 - 11w$

4. Identify the equivalent polynomials.

a) $-h^2 - 3 + 4h$ **b)** $-3 + 4h - h^2$

c) $5m - 3$ **d)** $-2 + y^2 + 5xy$

e) $y^2 + 5xy - 2$ **f)** $-3 + 5m$

5. Use algebra tiles to model each polynomial. Sketch the tiles.

a) $-5 + y^2$ **b)** $2x - 1$ **c)** $-3a^2 - 2a + 1$ **d)** $3z$ **e)** $v^2 - 4v$

6. Write a polynomial to match the following conditions.

a) 2 terms, degree 1, with a constant term of 4

b) 3 terms, degree 2, with the coefficient on the 2nd degree term –2

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Extra Practice 2

Lesson 5.2: Like Terms and Unlike Terms

1. From the list, identify terms that are like $2w^2$.

$-5w$, $-6w^2$, -2, $4w$, $3w^2$, $-w^2$, $11w$, 2

2. Combine like terms then simplified polynomial.

a) $4 + x + 1 + 5x + 1$

b) $-3y^2 + 3y - 2$

c) $2x^2 + 8 - 11 - 4x^2 + 5x^2$

d) $3y + 7y^2 + 1 - y - 2y - 3y^2$

g) $-4 + 2a + 7 - 4a$

i) $3a^2 - 2a - 4 + 2a - 3a^2 + 5$

j) $7z - z^2 + 3 + z^2 - 7$

l) $-6x^2 + 10x - 4 + 4 - 12x - 7x^2$

5. Identify the equivalent polynomials. Justify your responses.

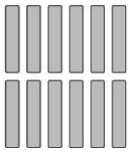
a) $-5y^2 - 3y - 4$ **b)** $10x - 1$ **c)** $1 + x - x^2$ **d)** $2y^2 - 4 - 16 - 7y^2 - 3y + 16$

e) $-7 + 5x - 7x - 8 + 14 + 12x$

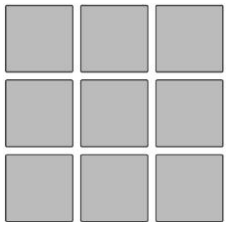
f) $5x^2 + 7 + 4x - 6x^2 - 6 - x - 2x$

6. Write a polynomial to represent the perimeter of each rectangle.

a)



b)



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Extra Practice 3

Lesson 5.3: Adding Polynomials

1. Add these polynomials.

a) $(x - 5) + (2x + 2)$

b) $(b^2 + 3b) + (b^2 - 3b)$

c) $(y^2 + 6y) + (-7y^2 + 2y)$

d) $(5n^2 + 5) + (-1 - 3n^2)$

2. Add these polynomials.

a) $(-7x + 5)$

$+ (2x - 8)$

b) $(4x^2 - 3)$

$+ (-8x^2 - 1)$

c) $(x^2 - 4x + 3)$

$+ (-x^2 - 2x - 3)$

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

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

3. Add.

a) $(y^2 + 6y - 5) + (-7y^2 + 2y - 2)$

b) $(-2n + 2n^2 + 2) + (-1 - 7n^2 + n)$

c) $(3m^2 + m) + (-10m^2 - m - 2)$

d) $(-3d^2 + 2) + (-2 - 7d^2 + d)$

4. a) For each shape below, write the perimeter as a sum of polynomials and in simplest form.

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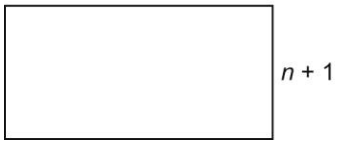
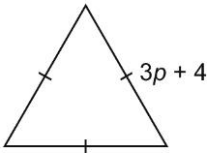
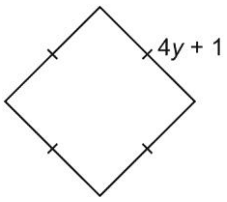
i)



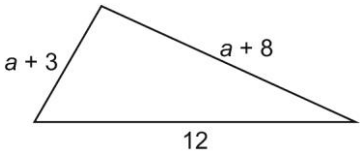
ii)



iii)



iv)



5. The sum of two polynomials is $4r + 5 - 3r^2$. One polynomial is $-8 - 2r^2 + 2r$; what is the other polynomial? Explain how you found your answer.

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Extra Practice 4

Lesson 5.4: Subtracting Polynomials

1. Subtract these polynomials.

a) $(2s^2 + 3s + 6) - (s^2 + s + 2)$

b) $(-12x^2 + 5x + 16) - (-x^2 + 2x + 12)$

c) $(4 - 8w) - (7w + 1)$

d) $(xy - x - 5y + 4y^2) - (6y^2 + 9y - xy)$

e) $(x^2 + 2x - 4) - (4x^2 + 2x - 2)$

f) $(-9z^2 - z - 2) - (3z^2 - z - 3)$

a) $(mn - 5m - 7) - (-6n + 2m + 1)$

b) $(2a + 3b - 3a^2 + b^2) - (-a^2 + 8b^2 + 3a - b)$

4. Explain why the student's solution is incorrect

$(3y^2 + 5y + 2) - (4y^2 + 3y + 2)$
$= 3y^2 - 5y - 2 - 4y^2 - 3y - 2$
$= 3y^2 - 4y^2 - 5y - 3y - 2 - 2$
$= -y^2 - 8y - 4$

5. The difference between two polynomials is $(5x + 3)$. One of the two polynomials is $(4x + 1 - 3x^2)$. What is the other polynomial? Explain how you found your answer.

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Extra Practice 5

Lesson 5.5: Multiplying and Dividing a Polynomial by a Constant

1. Multiply.

a) $2(3b)$ **b)** $-2(6h)$ **c)** $4(2b^2)$ **d)** $-2(2x^2)$ **e)** $-2(-y^2)$ **f)** $-3(-2f)$

2. Divide.

a) $12d \div 4$ **b)** $-20d \div 5$ **c)** $8d \div -4$ **d)** $12y^2 \div 4$ **e)** $-14x^2 \div 2$ **f)** $-10q \div -5$

3. Determine each product.

a) $4(3a + 2)$ **b)** $(d^2 + 2d)(-3)$ **c)** $2(4c^2 - 2c + 3)$

d) $(-2n^2 + n - 1)(6)$ **e)** $-3(-5m^2 + 6m + 7)$

4. Explain why the student's solution is incorrect.

$(-5k^2 - k - 3)(-2)$
$= -2(5k^2) - 2(k) - 2(3)$
$= -10k^2 - 2k - 6$

5. Determine each quotient.

a) $(16v + 16) \div (8)$ **b)** $(25k^2 - 15k) \div (5)$ **c)** $(20 - 8n) \div (-4)$

d) $(18x^2 - 6x + 6) \div (6)$ **e)** $(7 - 7y + 14y^2) \div (-7)$

6. Explain why the student's solution is incorrect.

$(-12r^2 - 8r - 16) \div (-4)$
$= \frac{-12r^2}{4} + \frac{-8r}{4} + \frac{-16}{4}$
$= -3r^2 - 2r + 4$

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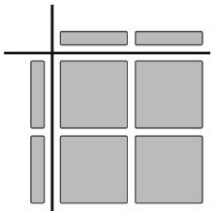
Extra Practice 6

Lesson 5.6 Multiplying and Dividing a Polynomial by a Monomial

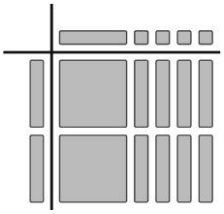
1. Write the multiplication sentence modelled by each set of algebra tiles.

a)



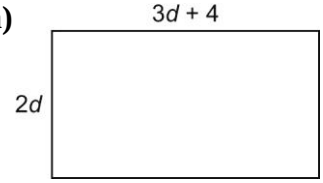
b)

c)

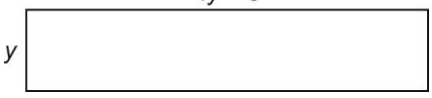


2. Write the multiplication sentence modelled by each rectangle.

a)



b)



5. Multiply.

a) $3c(5c + 2)$ **b)** $(8 + 4y)(6y)$ **c)** $5p(–5 – 2p)$ **e)** $(7k – 3)(–m)$ **f)** $(–1 – 10r)(–r)$

6. Divide.

a) $(6x + 3) \div 3$ **b)** $(14w – 7) \div –7$ **c)** $(–15 – 10q) \div 5$

d) $(8z^2 + 4z) \div 2z$ **e)** $(12c^2 – 6c) \div 3c$ **f)** $(9xy – 6x) \div –3x$

7. Explain why the student's solution is incorrect.

$(–12x^2 – 9x – 12xy) \div (–3x)$

$= \frac{–12x^2}{–3x} + \frac{9x}{–3x} + \frac{–12xy}{–3x}$

$= 4x^2 – 3 + 4xy$

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Extra Practice Sample Answers