Name: _____ **Class:** _____ **Date:** _____   **ID: A**
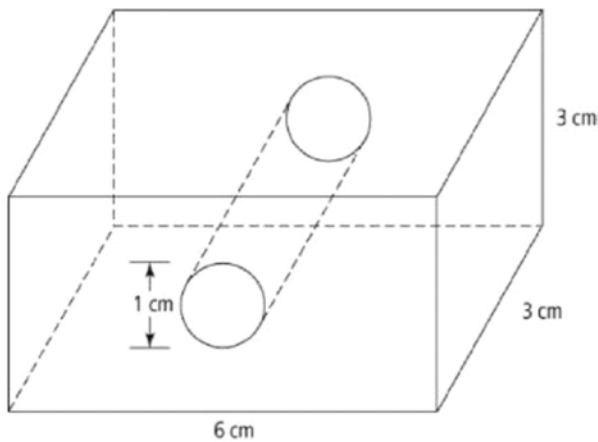
Midterm Review Package

Multiple Choice
Identify the choice that best completes the statement or answers the question.

1. In the figure shown below, the hole in the front surface extends straight through the object. The total surface area of the figure is

   A) 82.15 cm² B) 88.43 cm² C) 97.85 cm² D) 99.42 cm²

2. Each of the 12 identical cubes in the object has dimensions of 2 cm. What is the exposed surface area of the object, excluding the base?
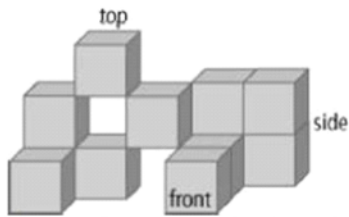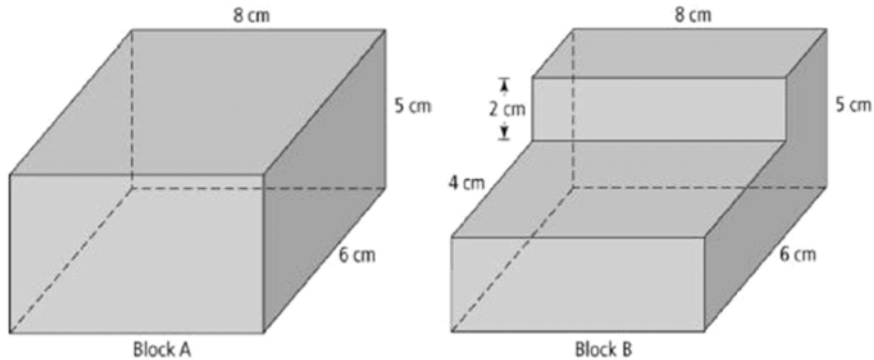

   A) 47 cm² B) 94 cm² C) 414 cm² D) 188 cm²

1

3. Compare the total surface area of Block A to Block B. Which statement is correct?

A) The surface area of Block A is equal to that of Block B   B) The surface area of Block A is greater than that of Block B   C) The surface area of Block B is greater than that of Block A   D) The surface area of Block B cannot be determined

4. What is $\frac{20}{27} \div \frac{5}{9}$?

A) $\frac{3}{2}$ B) $\frac{4}{3}$ C) $\frac{3}{4}$ D) $\frac{2}{3}$

5. Evaluate $\frac{11}{21} + \frac{1}{3}$.

A) $\frac{13}{14}$ B) $\frac{6}{7}$ C) $\frac{3}{4}$ D) $\frac{2}{3}$

6. Julia had $\frac{5}{6}$ of a pizza left over from a party. She gave Brooke $\frac{2}{5}$ of the leftover pizza. How much of the original pizza did Julia give to Brooke?

A) $\frac{7}{30}$ B) $\frac{1}{3}$ C) $\frac{7}{11}$ D) $\frac{2}{3}$

7. What is the side length of a square with an area of 196 m²?
A) 9 m   B) 14 m   C) 49 m   D) 98 m

8. A square picture has an area of 110.25 cm². To create a border, the picture is centred on a square mat with an area of 331.24 cm². Determine the width of mat around the picture.
A) 1.28 cm   B) 3.85 cm   C) 14.87 cm   D) 55.25 cm

9. A colony of 500 bacteria triples in size every 1.5 h. Determine the size of the colony after 6 h.
A) 2598   B) 3000   C) 20 250   D) 40 500

10. Which powers are equal in value? -32^2, 4^6, $(-5)^4$, 2^{10}
A) 4^6 and $(-5)^4$ B) $(-5)^4$ and 2^{10} C) -32^2 and 2^{10} D) -32^2 and 4^6

11. What is the degree of the term $9s^4t^3$?
A) 3   B) 4   C) 7   D) 9

2

12. The degree of the polynomial $5m^4 + 2m^3 - m^2 + 3m + 7$ is
    A) 2   B) 3   C) 4   D) 10

13. The model shown below can be represented by the polynomial

    A) $3z^2 + 7z + 2$ B) $2z^2 + 5z - 2$ C) $-z^2 - 3z - 2$ D) $z^2 + 3z - 2$

14. In the expression $2y^3 + 4y - 5$, the 2 is a(n)
    A) coefficient   B) exponent   C) term   D) variable

15. In the expression $3d^4 + 5d^2 - 15$, the d is a(n)
    A) coefficient   B) exponent   C) term   D) variable

16. Simplify the following expression by grouping like terms. $8q - 2q^2 + 3q - 6 + 5q^2 - 4q + 4 + 3q^2 - 2 - 2q$
    A) $10q^2 - 15q - 8$ B) $3q^2 + 11q - 8$ C) $10q^2 + 17q - 12$ D) $6q^2 + 5q - 4$

17. Subtract the following polynomials. $(7j^2 - 2j) - (-4j + 5)$
    A) $7j^2 + 4j - 5$ B) $7j^2 + 2j - 5$ C) $7j^2 - 2j - 5$ D) $7j^2 + 6j + 5$
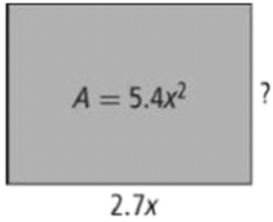
18. What is the area of the triangle shown below?
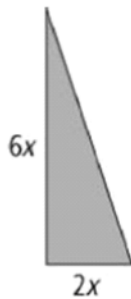
    A) $3x$ B) $3x^2$ C) $6x^2$ D) $12x^2$

19. Which expression represents $\left(\dfrac{2}{3}\right)^2 (3x)$ in simplified form?

    A) $\dfrac{4}{3}x$ B) $2x$ C) $4x$ D) $\dfrac{27}{2}x$

20. Determine the simplified form of the expression $(3xy)(2x)$.
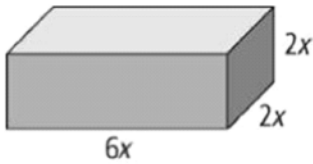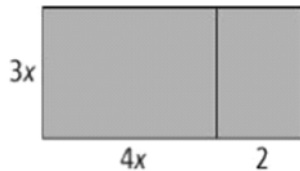   A) $6xy$ B) $5x^2y$ C) $6x^2y$ D) $1.5xy^2$

3

21. Determine the missing dimension of the rectangle below.

A) $0.5x$ B) $2x$ C) $2.7x^2$ D) $14.58x^3$

22. What is the volume of this rectangular prism?

A) 24 B) $-24x$ C) $-24x^2$ D) $24x^3$

23. Which multiplication statement is represented by the area model below?

A) $(3x)(4x+2) = 12x^2 + 6x$ B) $(3x)(4x-2) = 12x^2 - 6x$ C) $(3x)(4x+2) = 7x+2$ D) $(3x)(4x-2) = 7x-2$

24. Use the distributive property to expand $(5.2x)(-3x+2)$.
    A) $15.6x^2 - 10.4x$ B) $15.6x^2 + 10.4x$ C) $-15.6x^2 + 10.4x$ D) $-15.6x + 10.4$

25. What is the unknown dimension of the rectangle shown below?
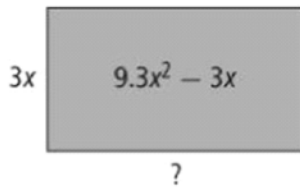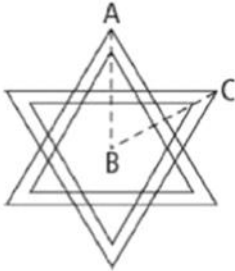

A) $3.1x+1$ B) $3.1x-1$ C) $3.1x$ D) 3.1

Completion
Complete each statement.

26. The dashed lines show the angle formed at the centre and between adjacent vertices. ∠ABC is called _____.

27. The measurement of the angle of rotation for the figure is _____.

28. Rational numbers are numbers that can be written in the form $\frac{a}{b}$, where a and b are _____.

29. Written as a mixed number, $-\frac{17}{5}$ is _____.

30. A perfect square can be expressed as the _____ of two equal rational factors.

31. Simplify the following by combining like terms.
    $-5d + 4 + 7d - 2$

32. Simplify the following by combining like terms.
    $2w^2 - 2w + 4 + 3w^2 + 3w - 9$

33. Subtract and simplify by combining like terms.
    $(3q^2 - 2q - 2) - (-2q^2 - 5q - 6)$

34. The product of $3.6x$ and $-2x$ is _____.

5

35. The quotient of $\dfrac{4.8t^2 - 7.2t + 24}{2.4}$ is _____ .

Matching

Match the correct term to each of the following descriptions. A term may be used more than once or not at all.

A) angle of rotation
B) centre of rotation
C) line of symmetry

D) mirror line
E) order of rotation
F) rotation symmetry

36. a figure may have one or more of these, or it may have none at all
37. occurs when a shape or design can be turned about its centre of rotation so that it fits onto its outline more than once in a complete turn
38. the minimum number of degrees or fractions of a turn needed to turn a shape or design onto itself
39. the number of times a shape or design fits onto itself in one turn
40. the point about which the rotation of an object or design turns

Match the correct term to each of the following descriptions. A term may be used more than once or not at all..

A) square root
B) rational number
C) perfect square

D) non-perfect square
E) mixed number
F) improper fraction

41. a number of the form $\dfrac{a}{b}$, where a and b are integers and $b \neq 0$
42. a rational number that cannot be expressed as the product of two equal rational factors
43. a fraction such as $\dfrac{11}{3}$
44. a factor that multiplies by itself to give that number
45. a fraction such as $3\dfrac{2}{3}$

Match the correct answer to the expression in each question. An answer may be used more than once or not at all.

A) 7^6
B) 4^3
C) 3^4

D) 140
E) 134
F) 9

46. $\left(2^2\right)^3$
47. $3^6 \div 3^2$
48. $6 + (4^3 \times 2)$
49. $3^3 \div \left(3^3 \div 9\right)$

50. $\dfrac{7^7}{7}$

Match the correct term to each of the following descriptions. A term may be used more than once or not at all.

A) base   D) power
B) exponent   E) standard form
C) exponential form   F) scientific notation

51. represents the number of times you multiply a number by itself
52. used to represent $2 \times 2 \times 2 \times 2$ as 2^4
53. refers to an expression such as 5^2 or 2^4
54. the number 5 in the expression 5^1
55. the number 2 in the expression 5^2

Match the correct term to each of the following descriptions. A term may be used more than once or not at all.

A) algebra   D) term
B) degree of a term   E) variable
C) expression

56. the sum of the exponents on the variables in a single term
57. a symbol that represents an unknown number
58. a branch of mathematics that uses symbols to represent unknown numbers or quantities
59. in $10p + 7$, $10p$ is an example of this, so is 7

Identify the letter of the term that best matches the description, definition, or example given below. Each term may be used more than once or not at all.

A) algebraic expression   D) polynomial
B) distributive property   E) term
C) like terms   F) variable

60. terms that have identical variables
61. a mathematical phrase made up of numbers and variables, connected by addition or subtraction operators
62. $a(x + y) = ax + ay$
63. a number or a variable, or the product of numbers and variables
64. a quantity whose value can change or vary

Identify the letter of the term that is equivalent to the expression below. Each term may be used more than once or not at all.

A) $-4x$ D) $4x^2$
B) $-4x - 8$ E) $5x^2 - 4x$
C) $-6.2x^2$ F) $8x^2 + 12x$

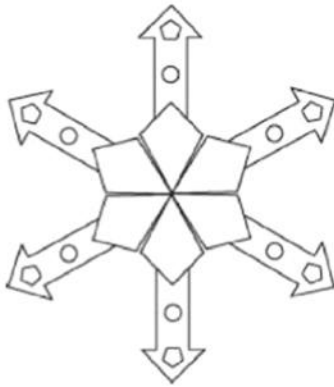65. $(3.1x)(-2x)$

7

66. $\dfrac{-8x^2}{2x}$

67. $(4x)(2x+3)$

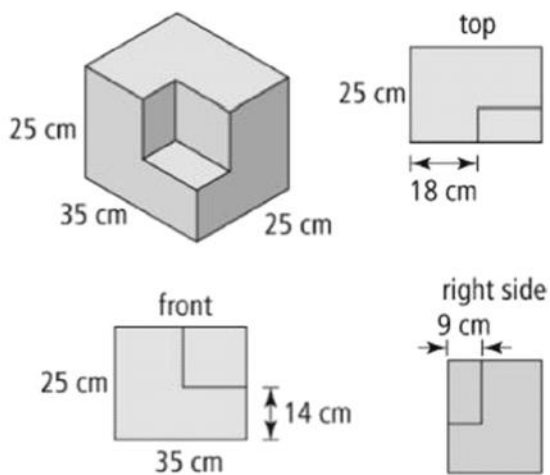68. $\dfrac{15x^2 - 12x}{3}$

69. $\dfrac{(x+2)(-4x)}{x}$

Short Answer

70. For the following figure, draw and label all lines of symmetry.

71. What is the surface area of the object?
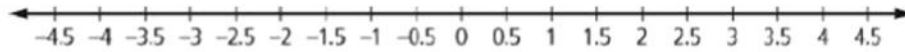

8

Write your answer in the space provided.

72. Indicate where each number falls on the number line.

    a) 0.75   **b)** $-\dfrac{1}{3}$ **c)** $2\dfrac{4}{5}$ **d)** -3.5

$$\text{–4.5} \quad \text{–4} \quad \text{–3.5} \quad \text{–3} \quad \text{–2.5} \quad \text{–2} \quad \text{–1.5} \quad \text{–1} \quad \text{–0.5} \quad 0 \quad 0.5 \quad 1 \quad 1.5 \quad 2 \quad 2.5 \quad 3 \quad 3.5 \quad 4 \quad 4.5$$

73. Jerry's bedroom is square. He has a square desk in his bedroom which has an area of 10 000 cm². The area of the bedroom is sixteen times the area of the desk. What is the side length of the bedroom?

74. Denise evaluated the following expression as shown:
$(4.5 - 7.8) \times (8.4 \div 2) = 3.3 \times 4.2$

$$= 13.86$$

Did she evaluate the expression correctly? If not, show all the steps to correctly evaluate the expression and show the correct solution. Explain where Denise went wrong.

75. Write each expression as a power.
    a) $9 \times 9 \times 9 \times 9$ **c)** $-1 \times -1 \times -1$
    b) $4 \times 4 \times 4 \times 4 \times 4$ **d)** $6 \times 6 \times 6 \times 6 \times 6 \times 6$

76. Evaluate each expression.
    a) 64 as a power of 2   **c)** 1296 as a power of 6
    b) 243 as a power of 3   **d)** 4096 as a power of 8

77. Given the side lengths below, calculate the volume of each cube.
    a) 8 cm   **c)** 50 mm
    b) 14 m   **d)** 0.6 km

78. Evaluate.
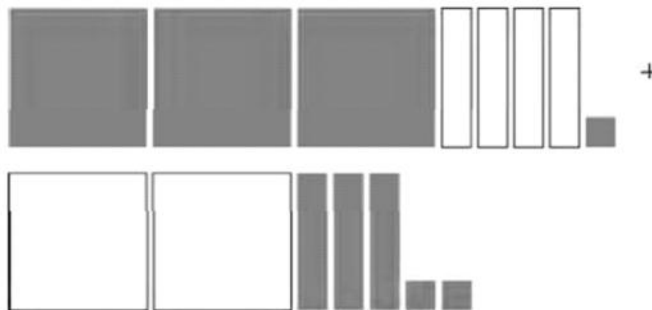   **a)** $10 \times 4 + 6^3$ **c)** $8^2 \div 4 + 2^2$
    b) $5 \times 2^5 - 6^2 \times 2$ **d)** $2 \times 5^3 \div (35 - 5^2)$

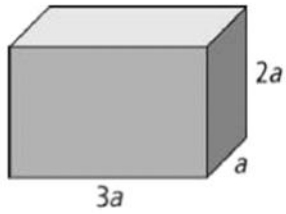79. Use an algebra tile model to represent the polynomial $4x^2 - 2x - 3$.

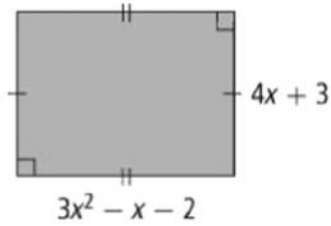80. Simplify. Show the answer as an expression.

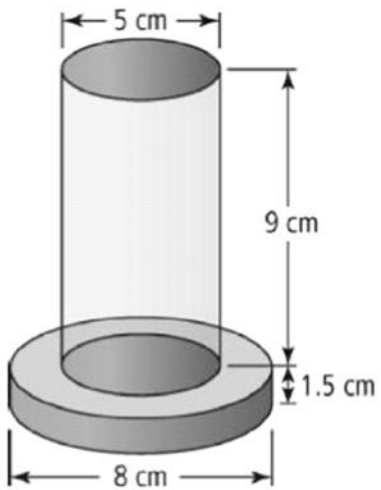81. What is the total surface area of this rectangular prism?

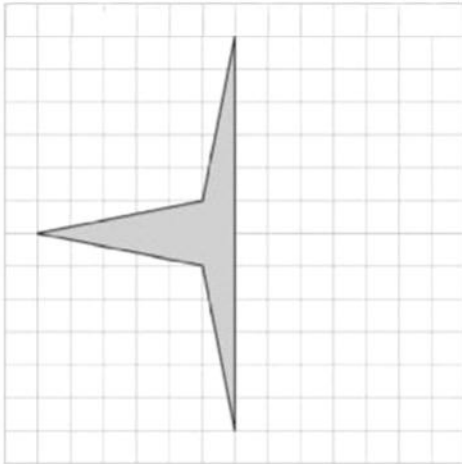82. Write and simplify an algebraic expression for the perimeter of the rectangle.

Problem

83. Whitney wants to repaint her bird feeder before she rehangs it in the yard. What is the surface area of the feeder? Express your answer to the nearest tenth of a square centimetre.
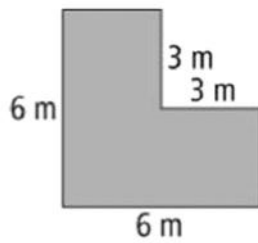

10

84. Use the line of symmetry to complete the figure.

85. Kevin explained to Brad that $4^6 \div 4^2 = 4^3$.
    a) Was Kevin's explanation correct or incorrect? Explain your thinking.
    b) Evaluate $4^6 \div 4^2$.

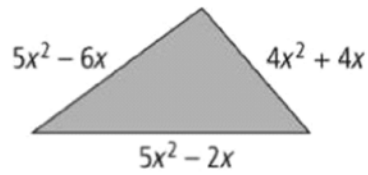86. A flower garden is shown below. What is the area of the garden?

87. The perimeter of the triangle below can be represented by the polynomial $14x^2 + 8x$. What is the missing side length?

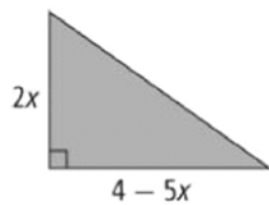88. Calculate the perimeter of the triangle shown.
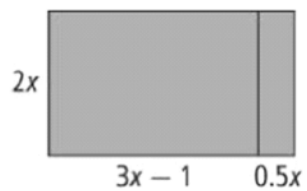
$5x^2 - 6x$ $4x^2 + 4x$

$5x^2 - 2x$

89. Write an expression to represent this model. What is the opposite expression?

90. Write a simplified expression for the area of the triangle.

$2x$

$4 - 5x$

91. Show two ways to calculate the total area of the two rectangles.

$2x$

$3x - 1$ $0.5x$

12

Midterm Review

Package (updated Jan 25, 2010)

1. C
2. D
3. B
4. B
5. B
6. B
7. B
8. B
9. D
10. No correct answer
11. C
12. C
13. D
14. A
15. D
16. D
17. B
18. C
19. A
20. C
21. B
22. D
23. A
24. C
25. B
26. Angle of rotation
27. 15 degrees
28. Integers
29. $-3\frac{2}{5}$
30. Product
31. $2d + 2$
32. $5w^2 + w - 5$
33. $5q^2 + 3q + 4$
34. $-7.2x^2$
35. $2t^2 - 3t + 10$
36. C
37. F
38. A
39. E
40. B

41. B
42. D
43. F
44. A
45. E
46. B
47. C
48. E
49. F
50. A
51. B
52. C
53. D
54. A
55. B
56. B
57. E
58. A
59. D
60. C
61. A
62. B
63. E
64. F
65. C
66. A
67. F
68. E
69. B
70.
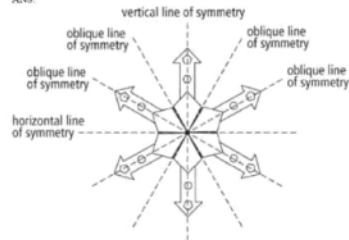
71. Top = 875 cm^2
    front 875 cm^2
    side 625 cm^2
    – TOTAL AREA IS 4750 cm^2
    The cutout does not affect the surface are of
    the object

72.
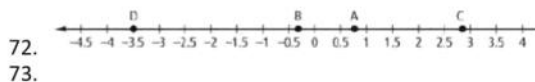
73.
ANS:
Area of bedroom = 16 × area of desk
$$= 16 \times 10\,000$$
$$= 160\,000 \text{ cm}^2$$
Side length of bedroom = $\sqrt{160\,000}$
$$= 400 \text{ cm}$$
The side length of the square bedroom is 400 cm.

74. -13.86

No, Denise did not evaluate the expression correctly. She made a mistake subtracting 7.8 from 4.5. The answer should be negative, not positive.

75.
A) 9^4 b) 4^5 c) $(-1)^3$ d) 6^6

76. A) 2^6 b) 3^5 c) 6^4 d) 8^4

77. A) 512 cm^3 b) 2744 m^3 c) 125 000 mm^3
    d) 0.216 km^3

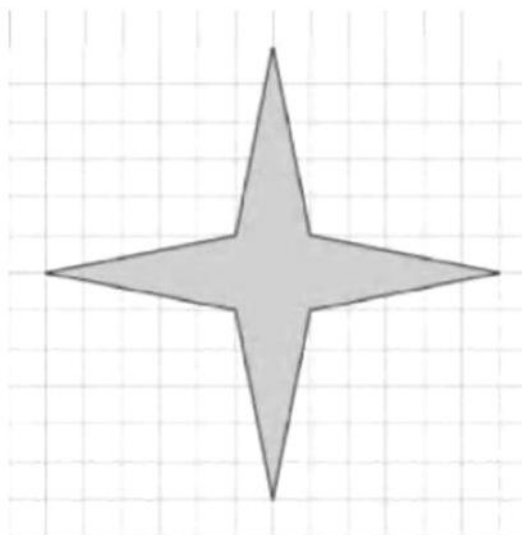78. A) 256   b) 88   c) 20   d) 25

79.

80. $p^2 - p + 3$

81. $22a^2$

82. $6x^2 + 6x + 2$

83. SA top + SA bottom − SA of join = 279.46 cm^2

84.

85. A) Kevin's explanation was incorrect. When dividing powers, the exponents should be subtracted not divided.

b) $4^4 = 256$

86. $6^2 - 3^2 = 36 - 9 = 27$ m^2
87. $5x^2 + 6x$
88. $14x^2 - 4x$
89. $(3x^2 - 2x + 4)$ and $(-3x^2 + 2x - 4)$
90. $4x - 5x^2$
91. $7x^2 - 2x$