

**Math 9 Final Exam****Multiple Choice**

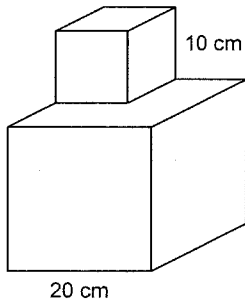
Identify the choice that best completes the statement or answers the question.

- \_\_\_\_\_ 1. Determine the value of  $\sqrt{2.56}$ .  
a. 0.64                      b. 0.16                      c. 0.8                      d. 1.6
- \_\_\_\_\_ 2. Calculate the number whose square root is 8.1.  
a. 0.9                      b. 32.4                      c. 65.61                      d. 81
- \_\_\_\_\_ 3. Which fraction is a perfect square?  
i)  $\frac{49}{60}$   
ii)  $\frac{49}{225}$   
iii)  $\frac{28}{225}$   
iv)  $\frac{7}{15}$   
a. ii                      b. iii                      c. iv                      d. i
- \_\_\_\_\_ 4. Which decimal has a square root between 14 and 15?  
i) 240.3  
ii) 169  
iii) 14.5  
iv) 204.5  
a. ii                      b. iii                      c. i                      d. iv
- \_\_\_\_\_ 5. Which fraction has a square root between 3 and 4?  
i)  $\frac{52}{3}$   
ii)  $\frac{61}{3}$   
iii)  $\frac{37}{4}$   
iv)  $\frac{79}{4}$   
a. iv                      b. ii                      c. iii                      d. i
- \_\_\_\_\_ 6. Estimate the value of  $\sqrt{0.15}$ , to the nearest tenth.  
a. 0.3                      b. 0.4                      c. 0.39                      d. 0.2
- \_\_\_\_\_ 7. Estimate the value of  $\sqrt{\frac{5}{11}}$ , to the nearest tenth.  
a. 0.7                      b. 0.6                      c. 0.67                      d. 0.5

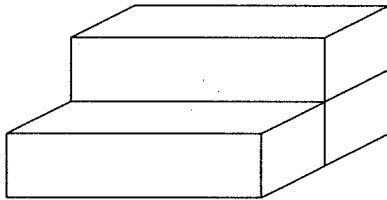
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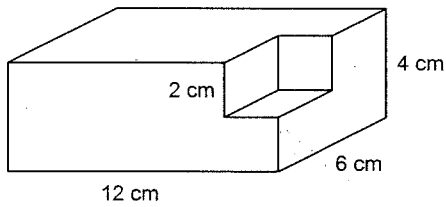
8. This composite object is made of a 10-cm cube on top of a 20-cm cube. Determine its surface area.



- a.  $2800 \text{ cm}^2$       b.  $2500 \text{ cm}^2$       c.  $2900 \text{ cm}^2$       d.  $3000 \text{ cm}^2$
9. This object is made from 3 identical right rectangular prisms. Each prism is 55 cm long and has square ends of side length 25 cm. What is the surface area of the object?



- a.  $20\,250 \text{ cm}^2$       b.  $12\,875 \text{ cm}^2$       c.  $12\,000 \text{ cm}^2$       d.  $14\,750 \text{ cm}^2$
10. This object is made of a right rectangular prism of length 12 cm, width 6 cm, and height 4 cm. A cube of side length 2 cm has been removed from one corner. Determine the surface area of the object.

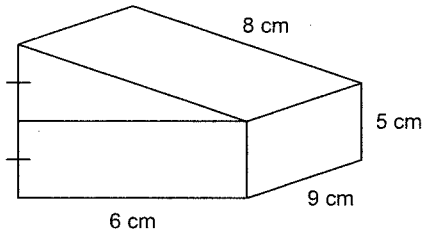


- a.  $312 \text{ cm}^2$       b.  $264 \text{ cm}^2$       c.  $288 \text{ cm}^2$       d.  $280 \text{ cm}^2$

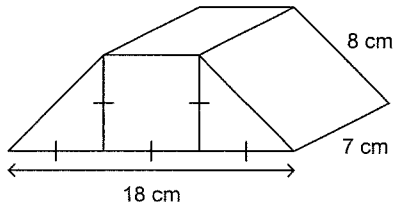
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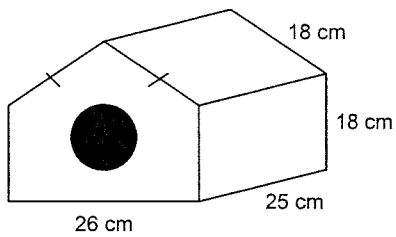
11. This object is composed of a right triangular prism on top of a right rectangular prism. Determine the surface area of the object.



- a.  $351 \text{ cm}^2$       b.  $297 \text{ cm}^2$       c.  $207 \text{ cm}^2$       d.  $441 \text{ cm}^2$
12. This object is composed of two right triangular prisms and a right rectangular prism. Determine the surface area of the object.

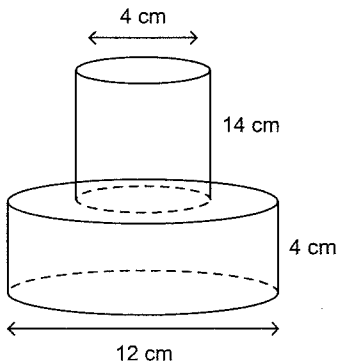


- a.  $298 \text{ cm}^2$       b.  $424 \text{ cm}^2$       c.  $568 \text{ cm}^2$       d.  $352 \text{ cm}^2$
13. This birdhouse is to be hung from the branch of a tree. The circular hole has diameter 8 cm. Determine the surface area of the birdhouse, to the nearest square centimetre.

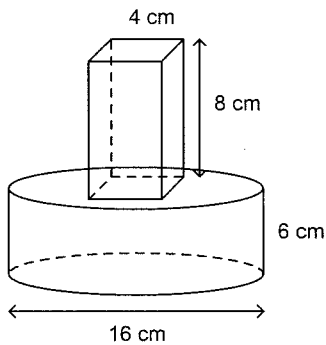


- a.  $3009 \text{ cm}^2$       b.  $3760 \text{ cm}^2$       c.  $3609 \text{ cm}^2$       d.  $3659 \text{ cm}^2$

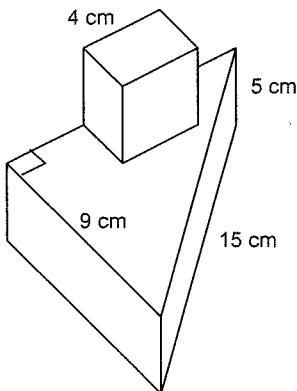
- \_\_\_\_\_ 14. This object is composed of a cylinder of diameter 4 cm and height 14 cm on top of another cylinder of diameter 12 cm and height 4 cm.  
Determine the surface area of the object, to the nearest square centimetre.



- a.  $440 \text{ cm}^2$       b.  $557 \text{ cm}^2$       c.  $561 \text{ cm}^2$       d.  $553 \text{ cm}^2$
- \_\_\_\_\_ 15. This object is composed of a rectangular prism on top of a cylinder.  
The rectangular prism has height 8 cm and square ends of side length 4 cm.  
The cylinder has diameter 16 cm and height 6 cm.  
Determine the surface area of the object, to the nearest square centimetre.

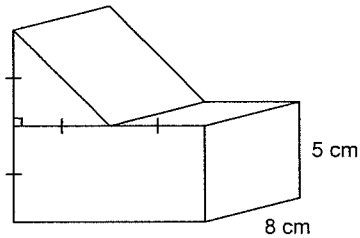


- a.  $631 \text{ cm}^2$       b.  $816 \text{ cm}^2$       c.  $832 \text{ cm}^2$       d.  $848 \text{ cm}^2$
- \_\_\_\_\_ 16. A 4-cm cube is attached to the top of a right triangular prism as shown.  
Determine the surface area of the composite object, to the nearest square centimetre.



- a.  $298 \text{ cm}^2$       b.  $352 \text{ cm}^2$       c.  $336 \text{ cm}^2$       d.  $368 \text{ cm}^2$

- \_\_\_\_\_ 17. An object is composed of a right rectangular prism and a triangular prism.  
Determine the surface area of this composite object, to the nearest square centimetre.



- a.  $422 \text{ cm}^2$       b.  $405 \text{ cm}^2$       c.  $447 \text{ cm}^2$       d.  $342 \text{ cm}^2$
- \_\_\_\_\_ 18. Write the base of  $-(-5)^3$ .  
a.  $-5$       b.  $5$       c.  $-5 \times 3$       d.  $3$
- \_\_\_\_\_ 19. Write  $7^5$  as repeated multiplication.  
a.  $5 \times 7$       c.  $7 \times 7 \times 7 \times 7 \times 7$   
b.  $7 + 7 + 7 + 7 + 7$       d.  $7 \times 7 \times 7 \times 7 \times 7 \times 7$
- \_\_\_\_\_ 20. Write  $(-4) \times (-4) \times (-4) \times (-4) \times (-4) \times (-4)$  as a power.  
a.  $(-4)^6$       b.  $6 \times (-4)$       c.  $-(-4)^6$       d.  $(-4)^5$
- \_\_\_\_\_ 21. Evaluate:  $-8^0$   
a.  $8$       b.  $0$       c.  $1$       d.  $-1$
- \_\_\_\_\_ 22. Evaluate:  $(-13)^0$   
a.  $0$       b.  $1$       c.  $-13$       d.  $-1$
- \_\_\_\_\_ 23. Evaluate:  $-(10^0)^9$   
a.  $-9$       b.  $1$       c.  $-1$       d.  $9$
- \_\_\_\_\_ 24. Evaluate:  $(3 + 4)^2 - (2 - 4)^3$   
a.  $-31$       b.  $57$       c.  $20$       d.  $41$
- \_\_\_\_\_ 25. Write the product of  $5^3 \times 5^4$  as a single power.  
a.  $5^7$       b.  $5^{12}$       c.  $10^7$       d.  $25^7$
- \_\_\_\_\_ 26. Write the product of  $(-7)^7 \times (-7)^3$  as a single power.  
a.  $(-7)^{10}$       b.  $(-14)^{10}$       c.  $49^{10}$       d.  $(-7)^{21}$
- \_\_\_\_\_ 27. Write the quotient of  $\frac{6^{10}}{6^5}$  as a single power.  
a.  $6^5$       b.  $6^{15}$       c.  $6^2$       d.  $2$
- \_\_\_\_\_ 28. Write the quotient of  $(-8)^{12} \div (-8)^4$  as a single power.  
a.  $3$       b.  $(-8)^8$       c.  $(-8)^3$       d.  $(-8)^{16}$
- \_\_\_\_\_ 29. Express  $7^9 \times 7^3 \div 7^6$  as a single power.  
a.  $7^2$       b.  $7^6$       c.  $7^{18}$       d.  $7^{21}$

\_\_\_\_\_ 30. Write  $[(-4) \times (-5)]^3$  as a product of powers.

a.  $3(-4) + 3(-5)$

c.  $(-4)^3 + (-5)^3$

b.  $(-4)^3 \times (-5)^3$

d.  $4^3 \times 5^3$

\_\_\_\_\_ 31. Write  $\left(\frac{11}{9}\right)^5$  as a quotient of powers.

a.  $2^5$

b.  $11^5 - 9^5$

c.  $\frac{11^5}{9^5}$

d.  $\frac{11^5}{9^1}$

\_\_\_\_\_ 32. Write  $-(7^2)^3$  as a power.

a.  $7^5$

b.  $-7^5$

c.  $-7^6$

d.  $7^6$

\_\_\_\_\_ 33. Identify the number that is NOT equal to the other three numbers.

$$\frac{-5}{8}, \frac{5}{-8}, \frac{-5}{-8}, \frac{-5}{8}$$

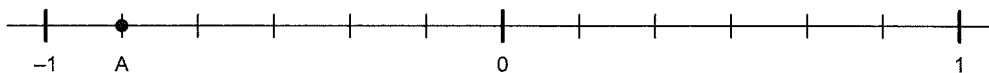
a.  $\frac{5}{-8}$

b.  $\frac{-5}{-8}$

c.  $-\frac{5}{8}$

d.  $\frac{-5}{8}$

\_\_\_\_\_ 34. Which rational number is represented by the letter A on the number line?



a.  $-0.5$

c.  $-5$

b.  $-0.8$

d.  $-\frac{5}{6}$

\_\_\_\_\_ 35. Order the numbers from least to greatest.

$$-0.4, -0.\bar{4}, -0.44$$

a.  $-0.44, -0.\bar{4}, -0.4$

c.  $-0.\bar{4}, -0.44, -0.4$

b.  $-0.4, -0.\bar{4}, -0.44$

d.  $-0.4, -44, -0.\bar{4}$

\_\_\_\_\_ 36. Evaluate.

$$(-0.4) \times (4.6) - (1.5)$$

a.  $-3.34$

b.  $-1.24$

c.  $-2.44$

d.  $3.34$

\_\_\_\_\_ 37. Evaluate.

$$\frac{5}{6} \div \left(\frac{4}{3} + \frac{1}{6}\right)$$

a.  $\frac{25}{54}$

b.  $\frac{8}{15}$

c.  $\frac{5}{9}$

d.  $\frac{19}{24}$

\_\_\_\_\_ 38. Evaluate.

$$\frac{2 \times 5 - 3}{4 + 3 \times 5}$$

a.  $\frac{1}{3}$

b.  $\frac{7}{19}$

c.  $-12$

d.  $\frac{4}{35}$

\_\_\_ 39. The formula  $F = \frac{9}{5} \times C + 32$  can be used to convert Celsius temperature to Fahrenheit.

Convert  $-20^{\circ}\text{C}$  to Fahrenheit.

- a.  $93.6^{\circ}\text{F}$       b.  $13.8^{\circ}\text{F}$       c.  $-4^{\circ}\text{F}$       d.  $-68^{\circ}\text{F}$

\_\_\_ 40. Which tables of values represent a linear relation?

i)

$x$	1	2	3	4	5
$y$	4	7	12	19	28

ii)

$x$	0	1	2	3	4
$y$	0	5	10	15	20

iii)

$x$	1	2	3	4	5
$y$	5	9	13	17	21

iv)

$x$	0	1	2	3	4
$y$	12	11	10	9	8

- a. ii, iii, and iv      b. ii and iii      c. All of these      d. i and iv

\_\_\_ 41. Complete the table of values.

$$y = 9 - 5x$$

$x$	2	4	6	8
$y$				

a.

$x$	2	4	6	8
$y$	4	-1	-6	-11

c.

$x$	2	4	6	8
$y$	4	8	12	16

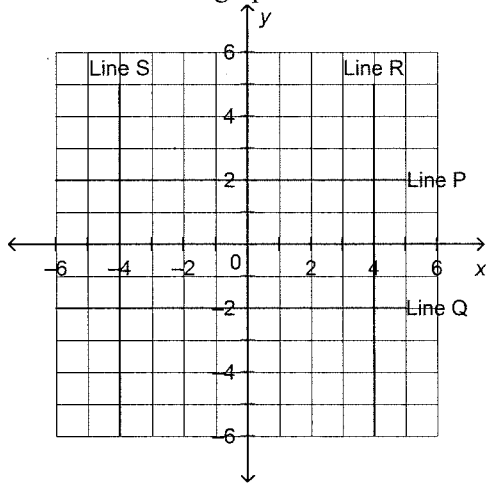
b.

$x$	2	4	6	8
$y$	8	16	24	32

d.

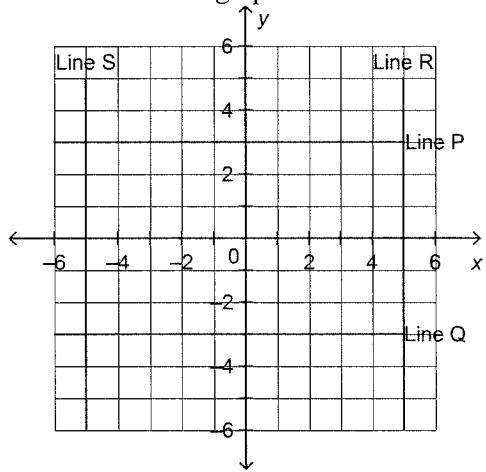
$x$	2	4	6	8
$y$	-1	-11	-21	-31

\_\_\_\_\_ 42. Which line is the graph of  $x = 4$ ?



- a. Line S                      b. Line P                      c. Line Q                      d. Line R

\_\_\_\_\_ 43. Which line is the graph of  $x + 5 = 0$ ?

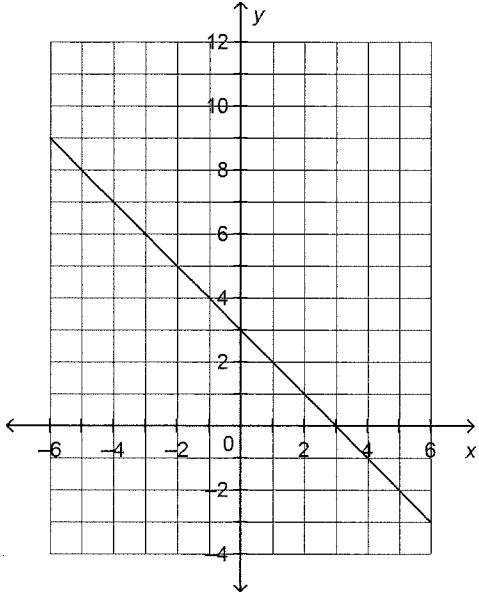


- a. Line R                      b. Line Q                      c. Line P                      d. Line S



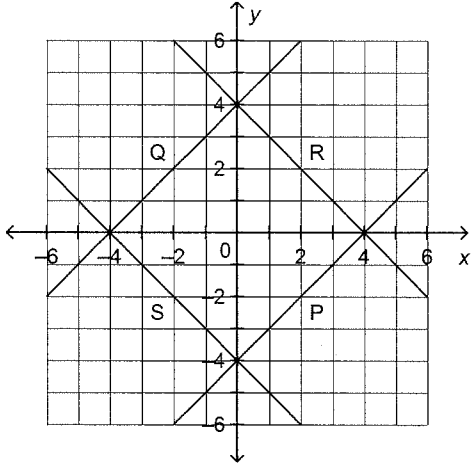
44. Which equation describes the graph?

- i)  $x + y = 3$
- ii)  $x - y = 3$
- iii)  $y - x = 3$
- iv)  $x + y = -3$



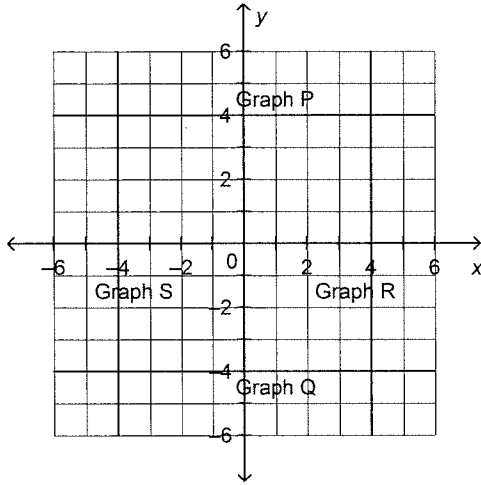
- a. i
- b. ii
- c. iii
- d. iv

45. Which line represents the equation  $x + y = 4$ ?



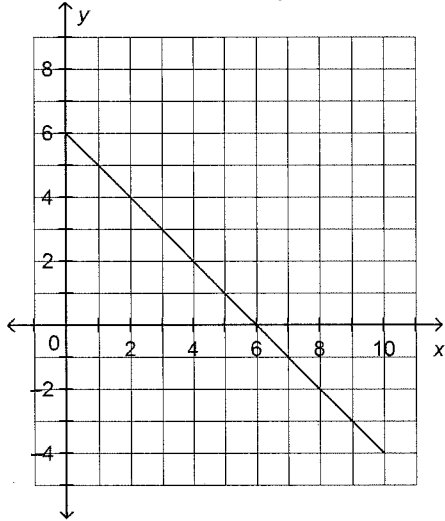
- a. Line R
- b. Line S
- c. Line P
- d. Line Q

\_\_\_\_\_ 46. Which graph on this grid has the equation  $y = -4$ ?



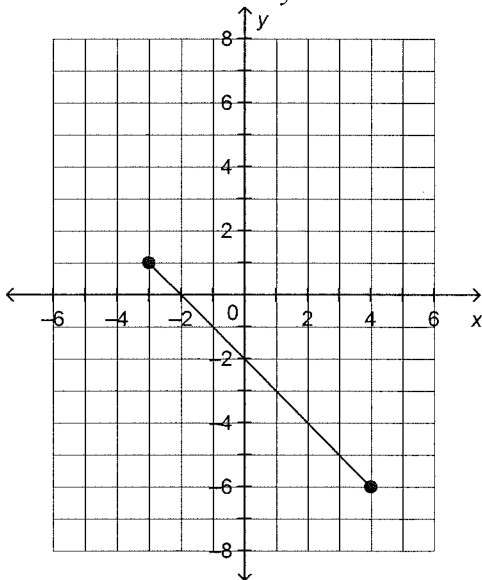
- a. Graph P      b. Graph S      c. Graph R      d. Graph Q

\_\_\_\_\_ 47. This graph represents a linear relation. Determine the value of  $y$  when  $x = 4$ .

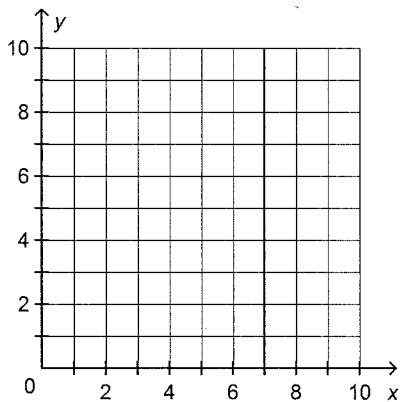


- a. 0      b. 2      c. 10      d. 6

48. This graph represents a linear relation.  
Determine the value of  $y$  when  $x = -5$ .



- a. 7                      b. 3                      c. 1                      d. 2
49. This graph represents a linear relation.  
Determine the value of  $x$  when  $y = 5$ .



- a. 12                      b. 5                      c. 0                      d. 7
50. A large white square represents an  $x^2$ -tile, a black rectangle represents a  $-x$ -tile, and a small white square represents a 1-tile.

Write the polynomial represented by this set of algebra tiles.



- a.  $3x^2 - x^3 + 5$       b.  $-3x^2 + 3x + 5$       c.  $3x^2 - 3x + 5$       d.  $3x - 3x^2 + 5$
51. How many terms are in the polynomial  $10x^2 + 5x - 11$ ?
- a. 10                      b. 1                      c. 11                      d. 3

- \_\_\_\_\_ 52. Which of the following expressions is a binomial with degree 2?
- i)  $x^2 - 6x + 5$   
 ii)  $3x^2$   
 iii)  $5x^2 - 2x$   
 iv)  $\frac{1}{x^2} - 7$
- a. i                      b. ii                      c. iv                      d. iii
- \_\_\_\_\_ 53. Name the coefficients of the variable in the polynomial  $-4x^2 + 10x - 12$ .
- a. -4                      b. -4, 10                      c. -4, -12                      d. 4, 10
- \_\_\_\_\_ 54. Combine like terms. Sketch algebra tiles if it helps.
- $9x^2 - 7x + 2x - 6x^2$
- a.  $-2x^2$                       b.  $3x^2 - 5x$                       c.  $2x^2 - 4x$                       d.  $3x^2 + 5x$
- \_\_\_\_\_ 55. Simplify:  $8x + 2 - 6 + 4x$
- a.  $10x - 2$                       b.  $12x - 4$                       c.  $8x$                       d.  $12x + 4$
- \_\_\_\_\_ 56. Simplify:  $10x^2 - 8 + 3x + 5 - 6x^2 - 6x$
- a.  $4x^2 - 3x + 3$                       c.  $4x^2 + 3x + 3$   
 b.  $4x^2 - 3x - 3$                       d.  $4x^4 - 3x^2 - 3$
- \_\_\_\_\_ 57. Add the polynomials. Visualize algebra tiles if it helps.
- $4x - 6$   
 $+ -8x + 11$
- a.  $4x + 5$                       b.  $4x - 5$                       c.  $-4x - 5$                       d.  $-4x + 5$
- \_\_\_\_\_ 58. Add:  $(7x - 5) + (3x + 9)$
- a.  $4x + 4$                       b.  $10x - 14$                       c.  $4x - 4$                       d.  $10x + 4$
- \_\_\_\_\_ 59. Add:  $(8x - 6) + (-4x - 2)$
- a.  $4x - 8$                       b.  $4x - 4$                       c.  $12x - 8$                       d.  $4x + 4$
- \_\_\_\_\_ 60. Add:  $(3x^2 - 5) + (6x^2 - 10x - 6)$
- a.  $9x^2 - 10x + 11$                       c.  $9x^2 - 15x - 6$   
 b.  $9x^2 - 10x - 11$                       d.  $18x^2 - 10x - 30$
- \_\_\_\_\_ 61. Subtract:  $(7t - 8) - (-7t - 8)$
- a.  $14t$                       b.  $-16$                       c.  $14t - 16$                       d.  $0$
- \_\_\_\_\_ 62. Subtract:  $(5r^2 - 4) - (8r^2 + 7r + 8)$
- a.  $3r^2 - 7r - 12$                       c.  $-3r^2 + 7r + 4$   
 b.  $-3r^2 - 7r - 12$                       d.  $3r^2 + 7r + 4$
- \_\_\_\_\_ 63. Subtract:  $(3 - 2c - 6c^2) - (5c - 3)$
- a.  $-6c^2 - 7c$                       c.  $-6c^2 + 7c - 6$   
 b.  $6c^2 + 7c - 6$                       d.  $-6c^2 - 7c + 6$

64. A white rectangle represents an  $x$ -tile and a small white square represents a 1-tile.

What is the multiplication sentence modelled by this set of algebra tiles?



- a.  $1x + 4$                       b.  $1(4x + 5)$                       c.  $1(1x + 5)$                       d.  $1(x + 5)$
65. A large black square represents a  $-x^2$  tile, a black rectangle represents an  $-x$ -tile, and a small white square represents a 1-tile.

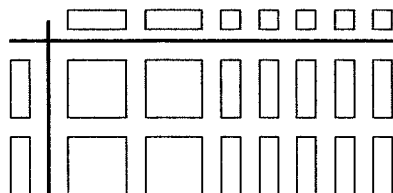
What is the division sentence modelled by this set of algebra tiles?



- a.  $\frac{-32x^2 - 32x + 16}{2}$       b.  $\frac{-2x^2 - 2x + 6}{2}$       c.  $\frac{-32x^2 + 32x + 48}{16}$       d.  $\frac{2x^2 - 2x + 6}{2}$
66. Multiply:  $3(4x)$   
 a.  $9x$                       b.  $7x$                       c.  $12x$                       d.  $6$
67. Multiply:  $6(3x^2 - 4x)$   
 a.  $9x^2 - 2x$                       b.  $18x^2 - 24x$                       c.  $18x^2 - 4x$                       d.  $18x^2 + 2x$
68. Divide:  $\frac{30p - 42}{6}$   
 a.  $5p - 42$                       b.  $30p - 36$                       c.  $5p - 7$                       d.  $24p - 36$
69. A large white square represents an  $x^2$ -tile, a white rectangle represents an  $x$ -tile, and a small white square represents a 1-tile.

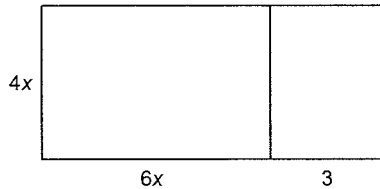
Which of these multiplication sentences is modelled by the algebra tiles below?

- i)  $2x(2x + 5)$   
 ii)  $2(2x^2 + 5)$   
 iii)  $x(2x + 5)$   
 iv)  $2x(4x^2 + 10x)$



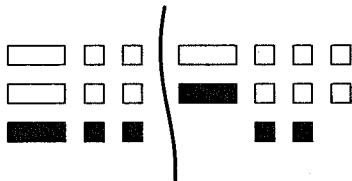
- a. iii                      b. ii                      c. i                      d. iv

70. Which of these multiplication sentences is modelled by the rectangle below?
- i)  $4x(6x - 3)$
  - ii)  $4x(-6x + 3)$
  - iii)  $6x(4x + 3)$
  - iv)  $4x(6x + 3)$

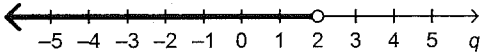
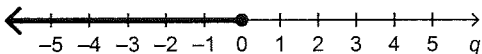
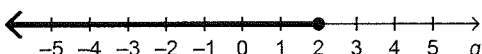
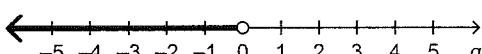
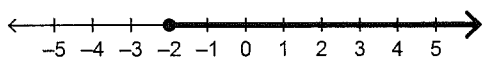


- a. iii                      b. ii                      c. i                      d. iv
71. Multiply:  $(-3w)(5w)$
- a.  $-8w^2$
  - b.  $-15w^2$
  - c.  $2w^2$
  - d.  $15w^2$
72. Divide:  $(9x^2) \div (-3x)$
- a.  $-3x$
  - b.  $-12x^2$
  - c.  $6x^2$
  - d.  $-3x^2$
73. Divide:  $\frac{-12x^2}{3x^2}$
- a.  $-4x$
  - b.  $-9x$
  - c.  $-4$
  - d.  $-9$
74. Solve:  $5 = -2x + 11$
- a. 8
  - b.  $-8$
  - c. 3
  - d.  $-3$
75. Solve:  $4x + 2.8 = 7.2$
- a. 0.4
  - b.  $-1$
  - c. 6.5
  - d. 1.1
76. Solve:  $8 = 5 + \frac{x}{3}$
- a.  $-7$
  - b. 19
  - c. 0
  - d. 9
77. A white rectangle represents a  $+x$ -tile, a black rectangle represents a  $-x$ -tile, a small white square represents a  $+1$ -tile, and a small black square represents a  $-1$ -tile.

Solve the equation represented by the algebra tiles.

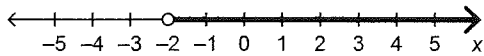


- a.  $x = 12$                       b.  $x = -2$                       c.  $x = 2$                       d.  $x = 1$
78. Solve:  $5 = \frac{35}{w}, w \neq 0$
- a.  $w = 7$
  - b.  $w = -30$
  - c.  $w = 175$
  - d.  $w = \frac{1}{7}$

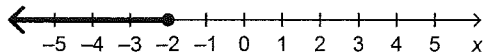
79. Solve:  $8y = 2y - 12$
- a.  $y = -2$                       b.  $y = -18$                       c.  $y = \frac{-10}{8}$                       d.  $y = 2$
80. Use a symbol to write an inequality that corresponds to this statement:  $x$  is less than or equal to 4
- a.  $x \geq 4$                       b.  $x > 4$                       c.  $x < 4$                       d.  $x \leq 4$
81. Which of these numbers is a solution of  $y > -5$ ?
- i) 5  
ii) -2  
iii) -5  
iv) -6
- a. i and iv                      b. iii and iv                      c. ii and iii                      d. i and ii
82. Which of these graphs represent the solution of the inequality  $q - 2 \leq 0$ ?
- i)
- 
- ii)
- 
- iii)
- 
- iv)
- 
- a. Graph ii                      b. Graph i                      c. Graph iii                      d. Graph iv
83. The solution to which inequality is graphed on the number line below?
- i)  $x + 2 \geq 0$   
ii)  $y - 1 \geq -1$   
iii)  $z + 2 > 0$   
iv)  $t - 1 > -1$
- 
- a. ii                      b. iv                      c. iii                      d. i
84. Solve:  $3.9 \leq y - 1.4$
- a.  $y \geq 2.5$                       b.  $y \leq 5.3$                       c.  $y \geq 5.3$                       d.  $y \leq 2.5$

85. Which of these graphs represent the solution of the inequality  $5x \geq -10$ ?

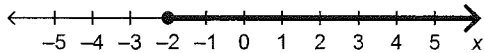
i)



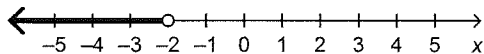
ii)



iii)



iv)



- a. Graph iii      b. Graph iv      c. Graph ii      d. Graph i

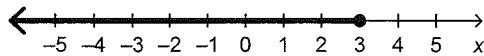
86. Which inequality has its solution graphed on the number line below?

i)  $2 + 3x \geq 11$

ii)  $3 - 3x \geq 12$

iii)  $5 - 3x \leq 14$

iv)  $5 + 3x \leq 14$



- a. i      b. ii      c. iv      d. ii

87. Which of these numbers are solutions of the inequality  $8 \leq 3y - 1$ ?

2, 5, 9, 3

a. 2, 3

b. 2, 9

c. 5, 9, 3

d. 2, 5, 9

88. Solve:  $\frac{m}{-3} < 7$

a.  $m > -21$

b.  $m < 21$

c.  $m > 21$

d.  $m < -21$

89. The last three days Alexa had a test and ate an energy bar on her way to school that morning, she did well on the test. Today she had a test, so she ate an energy bar on her way to school.

Was her decision based on theoretical probability, experimental probability, or subjective judgment?

a. A combination of theoretical probability and subjective judgment

b. Theoretical probability

c. Subjective judgment

d. Experimental probability

90. Jon's coworkers pool their money so they can buy more lottery tickets and increase their chance of winning. Is their decision based on theoretical probability, experimental probability, or subjective judgment?

a. A combination of theoretical and experimental probability

b. Theoretical probability

c. Experimental probability

d. Subjective judgment



- \_\_\_\_\_ 91. Leila arrives at the airport 3 hours before her flight to Chicago because each of the past 4 times she has travelled to the USA, it took her over 1.5 h to get through check-in and security.  
Is her decision based on theoretical probability, experimental probability, or subjective judgment?
- Subjective judgment
  - Experimental probability
  - A combination of theoretical probability and subjective judgment
  - Theoretical probability
- \_\_\_\_\_ 92. On a hot sunny day in June, teenagers were surveyed to find out how they feel about the city building a new outdoor ice skating rink. In this survey, which of the following might be a problem?
- Cultural sensitivity
  - Timing
  - Use of Language
  - Privacy
- a. i                      b. ii                      c. iii                      d. iv
- \_\_\_\_\_ 93. In an anonymous survey, students were asked:  
“Do you agree that everyone should become a vegetarian?”  
In this survey, which of the following might be a problem?
- Cultural sensitivity
  - Ethics
  - Privacy
  - Use of Language
- a. iv                      b. i                      c. ii                      d. iii
- \_\_\_\_\_ 94. A school principal interviewed a group of students.  
He asked them: “Do you like school?”  
In this survey, which of the following might be a problem with this question?
- Privacy
  - Cultural sensitivity
  - Use of Language
  - Cost
- a. iv                      b. iii                      c. ii                      d. i
- \_\_\_\_\_ 95. A cosmetics company wants to determine which eye shadow colours are preferred by the readers of a certain fashion magazine. What is the population they are interested in surveying?
- People who purchase the magazine
  - People who wear eye shadow
  - People who read the magazine
  - Fashion experts featured in the magazine
- a. i                      b. ii                      c. iv                      d. iii
- \_\_\_\_\_ 96. A city council wants to know if residents think there is a need for more library facilities.  
What is the population they are interested in surveying?
- Students who use the libraries
  - City residents
  - People who use the libraries
  - People who work at the libraries
- a. ii                      b. iii                      c. i                      d. iv

Name: \_\_\_\_\_

ID: A

- \_\_\_\_\_ 97. Drew wanted to know the proportion of grade 9 students in his school who travel to school using public transportation. Which population is he interested in surveying?
- i) All students in his school
  - ii) All grade 9 students in his school
  - iii) All students who use public transportation to get to school
  - iv) All grade 9 students who use public transportation to get to school
- a. iii                      b. ii                      c. i                      d. iv
- \_\_\_\_\_ 98. A company makes granola bars in batches of 1200. The quality control inspector tests 5 randomly selected bars from each batch. Which sampling method does the inspector use?
- a. Convenience sampling
  - b. Simple random sampling
  - c. Cluster sampling
  - d. Stratified random sampling
- \_\_\_\_\_ 99. A town council wants to know the public's opinion about increasing taxes to pay for more housing for the homeless. They hire people to conduct door-to-door interviews in randomly selected areas of town. Which sampling method did the town council use?
- a. Self-selected sampling
  - b. Simple random sampling
  - c. Systematic sampling
  - d. Cluster sampling
- \_\_\_\_\_ 100. A specialty craft store wants to know if customers are satisfied with the product selection. To find out, they interview every 20th person leaving the store for 1 week. Which sampling method does the store use?
- a. Simple random sampling
  - b. Systematic sampling
  - c. Cluster sampling
  - d. Self-selected sampling

## Math 9 Final Exam Answer Section

### MULTIPLE CHOICE

1. ANS: D                      PTS: 1                      DIF: Easy                      REF: 1.1 Square Roots of Perfect Squares  
LOC: 9.N5                      TOP: Number                      KEY: Procedural Knowledge
2. ANS: C                      PTS: 1                      DIF: Easy                      REF: 1.1 Square Roots of Perfect Squares  
LOC: 9.N5                      TOP: Number                      KEY: Procedural Knowledge
3. ANS: A                      PTS: 1                      DIF: Easy                      REF: 1.1 Square Roots of Perfect Squares  
LOC: 9.N5                      TOP: Number                      KEY: Conceptual Understanding
4. ANS: D                      PTS: 1                      DIF: Moderate  
REF: 1.2 Square Roots of Non-Perfect Squares                      LOC: 9.N6  
TOP: Number                      KEY: Conceptual Understanding
5. ANS: C                      PTS: 1                      DIF: Moderate  
REF: 1.2 Square Roots of Non-Perfect Squares                      LOC: 9.N6  
TOP: Number                      KEY: Conceptual Understanding
6. ANS: B                      PTS: 1                      DIF: Moderate  
REF: 1.2 Square Roots of Non-Perfect Squares                      LOC: 9.N6  
TOP: Number                      KEY: Procedural Knowledge
7. ANS: A                      PTS: 1                      DIF: Moderate  
REF: 1.2 Square Roots of Non-Perfect Squares                      LOC: 9.N6  
TOP: Number                      KEY: Procedural Knowledge
8. ANS: A                      PTS: 1                      DIF: Moderate  
REF: 1.3 Surface Areas of Objects Made from Right Rectangular Prisms  
LOC: 9.SS2                      TOP: Shape and Space (3-D Objects and 2-D Shapes)  
KEY: Procedural Knowledge
9. ANS: D                      PTS: 1                      DIF: Moderate  
REF: 1.3 Surface Areas of Objects Made from Right Rectangular Prisms  
LOC: 9.SS2                      TOP: Shape and Space (3-D Objects and 2-D Shapes)  
KEY: Procedural Knowledge
10. ANS: C                      PTS: 1                      DIF: Moderate  
REF: 1.3 Surface Areas of Objects Made from Right Rectangular Prisms  
LOC: 9.SS2                      TOP: Shape and Space (3-D Objects and 2-D Shapes)  
KEY: Procedural Knowledge
11. ANS: A                      PTS: 1                      DIF: Easy  
REF: 1.4 Surface Areas of Other Composite Objects                      LOC: 9.SS2  
TOP: Shape and Space (3-D Objects and 2-D Shapes)                      KEY: Procedural Knowledge
12. ANS: B                      PTS: 1                      DIF: Easy  
REF: 1.4 Surface Areas of Other Composite Objects                      LOC: 9.SS2  
TOP: Shape and Space (3-D Objects and 2-D Shapes)                      KEY: Procedural Knowledge
13. ANS: D                      PTS: 1                      DIF: Easy  
REF: 1.4 Surface Areas of Other Composite Objects                      LOC: 9.SS2  
TOP: Shape and Space (3-D Objects and 2-D Shapes)  
KEY: Procedural Knowledge | Problem-Solving Skills

14. ANS: D           PTS: 1           DIF: Easy  
REF: 1.4 Surface Areas of Other Composite Objects           LOC: 9.SS2  
TOP: Shape and Space (3-D Objects and 2-D Shapes)           KEY: Procedural Knowledge
15. ANS: C           PTS: 1           DIF: Easy  
REF: 1.4 Surface Areas of Other Composite Objects           LOC: 9.SS2  
TOP: Shape and Space (3-D Objects and 2-D Shapes)           KEY: Procedural Knowledge
16. ANS: B           PTS: 1           DIF: Easy  
REF: 1.4 Surface Areas of Other Composite Objects           LOC: 9.SS2  
TOP: Shape and Space (3-D Objects and 2-D Shapes)           KEY: Procedural Knowledge
17. ANS: A           PTS: 1           DIF: Easy  
REF: 1.4 Surface Areas of Other Composite Objects           LOC: 9.SS2  
TOP: Shape and Space (3-D Objects and 2-D Shapes)           KEY: Procedural Knowledge
18. ANS: A           PTS: 1           DIF: Easy           REF: 2.1 What Is a Power?  
LOC: 9.N1           TOP: Number           KEY: Conceptual Understanding
19. ANS: C           PTS: 1           DIF: Easy           REF: 2.1 What Is a Power?  
LOC: 9.N1           TOP: Number           KEY: Procedural Knowledge
20. ANS: A           PTS: 1           DIF: Easy           REF: 2.1 What Is a Power?  
LOC: 9.N1           TOP: Number           KEY: Procedural Knowledge
21. ANS: D           PTS: 1           DIF: Easy  
REF: 2.2 Powers of Ten and the Zero Exponent           LOC: 9.N1  
TOP: Number           KEY: Procedural Knowledge
22. ANS: B           PTS: 1           DIF: Easy  
REF: 2.2 Powers of Ten and the Zero Exponent           LOC: 9.N1  
TOP: Number           KEY: Procedural Knowledge
23. ANS: C           PTS: 1           DIF: Moderate  
REF: 2.2 Powers of Ten and the Zero Exponent           LOC: 9.N1  
TOP: Number           KEY: Procedural Knowledge
24. ANS: B           PTS: 1           DIF: Moderate  
REF: 2.3 Order of Operations with Powers           LOC: 9.N1  
TOP: Number           KEY: Procedural Knowledge
25. ANS: A           PTS: 1           DIF: Easy           REF: 2.4 Exponent Laws I  
LOC: 9.N2           TOP: Number           KEY: Procedural Knowledge
26. ANS: A           PTS: 1           DIF: Easy           REF: 2.4 Exponent Laws I  
LOC: 9.N2           TOP: Number           KEY: Procedural Knowledge
27. ANS: A           PTS: 1           DIF: Easy           REF: 2.4 Exponent Laws I  
LOC: 9.N2           TOP: Number           KEY: Procedural Knowledge
28. ANS: B           PTS: 1           DIF: Easy           REF: 2.4 Exponent Laws I  
LOC: 9.N2           TOP: Number           KEY: Procedural Knowledge
29. ANS: B           PTS: 1           DIF: Moderate       REF: 2.4 Exponent Laws I  
LOC: 9.N2           TOP: Number           KEY: Procedural Knowledge
30. ANS: B           PTS: 1           DIF: Easy           REF: 2.5 Exponent Laws II  
LOC: 9.N2           TOP: Number           KEY: Procedural Knowledge
31. ANS: C           PTS: 1           DIF: Easy           REF: 2.5 Exponent Laws II  
LOC: 9.N2           TOP: Number           KEY: Procedural Knowledge
32. ANS: C           PTS: 1           DIF: Easy           REF: 2.5 Exponent Laws II  
LOC: 9.N2           TOP: Number           KEY: Procedural Knowledge

33. ANS: B           PTS: 1           DIF: Easy           REF: 3.1 What Is a Rational Number?  
LOC: 9.N3           TOP: Number       KEY: Conceptual Understanding
34. ANS: D           PTS: 1           DIF: Easy           REF: 3.1 What Is a Rational Number?  
LOC: 9.N3           TOP: Number       KEY: Conceptual Understanding
35. ANS: C           PTS: 1           DIF: Moderate       REF: 3.1 What Is a Rational Number?  
LOC: 9.N3           TOP: Number       KEY: Conceptual Understanding | Procedural Knowledge
36. ANS: A           PTS: 1           DIF: Easy  
REF: 3.6 Order of Operations with Rational Numbers       LOC: 9.N4  
TOP: Number       KEY: Procedural Knowledge
37. ANS: C           PTS: 1           DIF: Moderate  
REF: 3.6 Order of Operations with Rational Numbers       LOC: 9.N4  
TOP: Number       KEY: Procedural Knowledge
38. ANS: B           PTS: 1           DIF: Moderate  
REF: 3.6 Order of Operations with Rational Numbers       LOC: 9.N4  
TOP: Number       KEY: Procedural Knowledge
39. ANS: C           PTS: 1           DIF: Moderate  
REF: 3.6 Order of Operations with Rational Numbers       LOC: 9.N4  
TOP: Number       KEY: Procedural Knowledge
40. ANS: A           PTS: 1           DIF: Moderate       REF: 4.2 Linear Relations  
LOC: 9.PR2       TOP: Patterns and Relations (Patterns)   KEY: Procedural Knowledge
41. ANS: D           PTS: 1           DIF: Moderate       REF: 4.2 Linear Relations  
LOC: 9.PR2       TOP: Patterns and Relations (Patterns)   KEY: Procedural Knowledge
42. ANS: D           PTS: 1           DIF: Easy  
REF: 4.3 Another Form of the Equation for a Linear Relation   LOC: 9.PR1  
TOP: Patterns and Relations (Patterns)   KEY: Conceptual Understanding
43. ANS: D           PTS: 1           DIF: Easy  
REF: 4.3 Another Form of the Equation for a Linear Relation   LOC: 9.PR1  
TOP: Patterns and Relations (Patterns)   KEY: Conceptual Understanding
44. ANS: A           PTS: 1           DIF: Moderate  
REF: 4.3 Another Form of the Equation for a Linear Relation   LOC: 9.PR1  
TOP: Patterns and Relations (Patterns)   KEY: Procedural Knowledge
45. ANS: A           PTS: 1           DIF: Moderate  
REF: 4.3 Another Form of the Equation for a Linear Relation   LOC: 9.PR1  
TOP: Patterns and Relations (Patterns)   KEY: Procedural Knowledge
46. ANS: D           PTS: 1           DIF: Easy           REF: 4.4 Matching Equations and Graphs  
LOC: 9.PR2       TOP: Patterns and Relations (Patterns)   KEY: Procedural Knowledge
47. ANS: B           PTS: 1           DIF: Easy  
REF: 4.5 Using Graphs to Estimate Values       LOC: 9.PR2  
TOP: Patterns and Relations (Patterns)   KEY: Procedural Knowledge
48. ANS: B           PTS: 1           DIF: Moderate  
REF: 4.5 Using Graphs to Estimate Values       LOC: 9.PR2  
TOP: Patterns and Relations (Patterns)   KEY: Procedural Knowledge
49. ANS: D           PTS: 1           DIF: Moderate  
REF: 4.5 Using Graphs to Estimate Values       LOC: 9.PR2  
TOP: Patterns and Relations (Patterns)   KEY: Procedural Knowledge
50. ANS: C           PTS: 1           DIF: Easy           REF: 5.1 Modelling Polynomials  
LOC: 9.PR5       TOP: Patterns and Relations (Variables and Equations)  
KEY: Conceptual Understanding

51. ANS: D           PTS: 1           DIF: Easy           REF: 5.1 Modelling Polynomials  
 LOC: 9.PR5        TOP: Patterns and Relations (Variables and Equations)  
 KEY: Conceptual Understanding
52. ANS: D           PTS: 1           DIF: Easy           REF: 5.1 Modelling Polynomials  
 LOC: 9.PR5        TOP: Patterns and Relations (Variables and Equations)  
 KEY: Conceptual Understanding
53. ANS: B           PTS: 1           DIF: Easy           REF: 5.1 Modelling Polynomials  
 LOC: 9.PR5        TOP: Patterns and Relations (Variables and Equations)  
 KEY: Conceptual Understanding
54. ANS: B           PTS: 1           DIF: Easy           REF: 5.2 Like Terms and Unlike Terms  
 LOC: 9.PR5        TOP: Patterns and Relations (Variables and Equations)  
 KEY: Procedural Knowledge
55. ANS: B           PTS: 1           DIF: Easy           REF: 5.2 Like Terms and Unlike Terms  
 LOC: 9.PR5        TOP: Patterns and Relations (Variables and Equations)  
 KEY: Procedural Knowledge
56. ANS: B           PTS: 1           DIF: Moderate       REF: 5.2 Like Terms and Unlike Terms  
 LOC: 9.PR5        TOP: Patterns and Relations (Variables and Equations)  
 KEY: Procedural Knowledge
57. ANS: D           PTS: 1           DIF: Easy           REF: 5.3 Adding Polynomials  
 LOC: 9.PR6        TOP: Patterns and Relations (Variables and Equations)  
 KEY: Procedural Knowledge
58. ANS: D           PTS: 1           DIF: Easy           REF: 5.3 Adding Polynomials  
 LOC: 9.PR6        TOP: Patterns and Relations (Variables and Equations)  
 KEY: Procedural Knowledge
59. ANS: A           PTS: 1           DIF: Easy           REF: 5.3 Adding Polynomials  
 LOC: 9.PR6        TOP: Patterns and Relations (Variables and Equations)  
 KEY: Procedural Knowledge
60. ANS: B           PTS: 1           DIF: Moderate       REF: 5.3 Adding Polynomials  
 LOC: 9.PR6        TOP: Patterns and Relations (Variables and Equations)  
 KEY: Procedural Knowledge
61. ANS: A           PTS: 1           DIF: Easy           REF: 5.4 Subtracting Polynomials  
 LOC: 9.PR6        TOP: Patterns and Relations (Variables and Equations)  
 KEY: Procedural Knowledge
62. ANS: B           PTS: 1           DIF: Moderate       REF: 5.4 Subtracting Polynomials  
 LOC: 9.PR6        TOP: Patterns and Relations (Variables and Equations)  
 KEY: Procedural Knowledge
63. ANS: D           PTS: 1           DIF: Moderate       REF: 5.4 Subtracting Polynomials  
 LOC: 9.PR6        TOP: Patterns and Relations (Variables and Equations)  
 KEY: Procedural Knowledge
64. ANS: D           PTS: 1           DIF: Easy  
 REF: 5.5 Multiplying and Dividing a Polynomial by a Constant  
 LOC: 9.PR7        TOP: Patterns and Relations (Variables and Equations)  
 KEY: Procedural Knowledge
65. ANS: B           PTS: 1           DIF: Easy  
 REF: 5.5 Multiplying and Dividing a Polynomial by a Constant  
 LOC: 9.PR7        TOP: Patterns and Relations (Variables and Equations)  
 KEY: Procedural Knowledge

66. ANS: C           PTS: 1           DIF: Easy  
REF: 5.5 Multiplying and Dividing a Polynomial by a Constant  
LOC: 9.PR7        TOP: Patterns and Relations (Variables and Equations)  
KEY: Procedural Knowledge
67. ANS: B           PTS: 1           DIF: Moderate  
REF: 5.5 Multiplying and Dividing a Polynomial by a Constant  
LOC: 9.PR7        TOP: Patterns and Relations (Variables and Equations)  
KEY: Procedural Knowledge
68. ANS: C           PTS: 1           DIF: Moderate  
REF: 5.5 Multiplying and Dividing a Polynomial by a Constant  
LOC: 9.PR7        TOP: Patterns and Relations (Variables and Equations)  
KEY: Procedural Knowledge
69. ANS: C           PTS: 1           DIF: Easy  
REF: 5.6 Multiplying and Dividing a Polynomial by a Monomial  
LOC: 9.PR7        TOP: Patterns and Relations (Variables and Equations)  
KEY: Procedural Knowledge
70. ANS: D           PTS: 1           DIF: Easy  
REF: 5.6 Multiplying and Dividing a Polynomial by a Monomial  
LOC: 9.PR7        TOP: Patterns and Relations (Variables and Equations)  
KEY: Procedural Knowledge
71. ANS: B           PTS: 1           DIF: Easy  
REF: 5.6 Multiplying and Dividing a Polynomial by a Monomial  
LOC: 9.PR7        TOP: Patterns and Relations (Variables and Equations)  
KEY: Procedural Knowledge
72. ANS: A           PTS: 1           DIF: Easy  
REF: 5.6 Multiplying and Dividing a Polynomial by a Monomial  
LOC: 9.PR7        TOP: Patterns and Relations (Variables and Equations)  
KEY: Procedural Knowledge
73. ANS: C           PTS: 1           DIF: Easy  
REF: 5.6 Multiplying and Dividing a Polynomial by a Monomial  
LOC: 9.PR7        TOP: Patterns and Relations (Variables and Equations)  
KEY: Procedural Knowledge
74. ANS: C           PTS: 1           DIF: Easy  
REF: 6.1 Solving Equations by Using Inverse Operations        LOC: 9.PR3  
TOP: Patterns and Relations (Variables and Equations)        KEY: Procedural Knowledge
75. ANS: D           PTS: 1           DIF: Easy  
REF: 6.1 Solving Equations by Using Inverse Operations        LOC: 9.PR3  
TOP: Patterns and Relations (Variables and Equations)        KEY: Procedural Knowledge
76. ANS: D           PTS: 1           DIF: Easy  
REF: 6.1 Solving Equations by Using Inverse Operations        LOC: 9.PR3  
TOP: Patterns and Relations (Variables and Equations)        KEY: Procedural Knowledge
77. ANS: C           PTS: 1           DIF: Easy  
REF: 6.2 Solving Equations by Using Balance Strategies        LOC: 9.PR3  
TOP: Patterns and Relations (Variables and Equations)        KEY: Procedural Knowledge
78. ANS: A           PTS: 1           DIF: Easy  
REF: 6.2 Solving Equations by Using Balance Strategies        LOC: 9.PR3  
TOP: Patterns and Relations (Variables and Equations)        KEY: Procedural Knowledge