

Alberta Provincial Achievement Testing 2011:
Practice Questions Booklet 1

Multiple Choice

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

- ___ 1. Determine the value of $\sqrt{0.16}$.
a. 0.4 b. 0.07 c. 0.2 d. 0.04
- ___ 2. Write one hundred million as a power of 10.
a. 10^{12} b. 10^8 c. 10^{11} d. 10^7
- ___ 3. Evaluate: $[(-4) \times (5)]^3$
a. 8000 b. -1 c. $\frac{1}{8000}$ d. 1
- ___ 4. Which expressions have negative values?
i) $[-(-4)^3]^3$
ii) $(-4^3)^3$
iii) $[(-4)^3]^3$
iv) $-[(-4)^3]^3$
a. ii and iii b. i and iv c. i and ii d. iii and iv
- ___ 5. Which numbers are rational numbers?
 $-5.4, \frac{7}{6}, 11, -\frac{1}{4}$
a. $\frac{7}{6}$ c. All of them
b. $-5.4, \frac{7}{6},$ and $-\frac{1}{4}$ d. $\frac{7}{6}$ and 11
- ___ 6. Identify equal rational numbers in this list:
 $\frac{-3}{-4}, \frac{-3}{4}, -\frac{4}{3}, \frac{3}{-4}, -\frac{3}{4}$
a. $-\frac{4}{3}$ and $\frac{3}{-4}$ c. $\frac{-3}{4}, -\frac{4}{3},$ and $-\frac{3}{4}$
b. $\frac{-3}{4}, \frac{3}{-4},$ and $-\frac{3}{4}$ d. $\frac{-3}{-4}$ and $-\frac{4}{3}$
- ___ 7. Estimate to determine which sum is greater than 0.
i) $5.8 + (-7.7)$
ii) $-1.1 + (-1.8)$

iii) $-3.3 + 3.6$

iv) $-3.6 + 2.8$

a. i

b. ii

c. iv

d. iii

___ 8. Which expression has the least sum?

i) $9.43 + 6.05$

iii) $9.43 + (-6.05)$

ii) $-9.43 + 6.05$

iv) $-9.43 + (-6.05)$

a. ii

b. i

c. iii

d. iv

___ 9. Which expression has the same answer as $-\frac{3}{4} - \left(-\frac{7}{8}\right)$?

i) $-\frac{3}{4} - \frac{7}{8}$

ii) $\frac{3}{4} + \frac{7}{8}$

iii) $-\frac{3}{4} + \frac{7}{8}$

iv) $\frac{3}{4} - \left(-\frac{7}{8}\right)$

a. ii

b. i

c. iv

d. iii

___ 10. *This question could not be placed here due to copyright issues.*

___ 11. Evaluate.

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

a. ≈ 3.34

b. ≈ 1.24

c. ≈ 2.44

d. 3.34

___ 12. Which equations describe vertical lines?

i) $x + 5 = 12$

ii) $y - 12 = 5$

iii) $x + y = 5$

iv) $12x = 5$

a. i and iii

b. ii and iii

c. ii and iv

d. i and iv

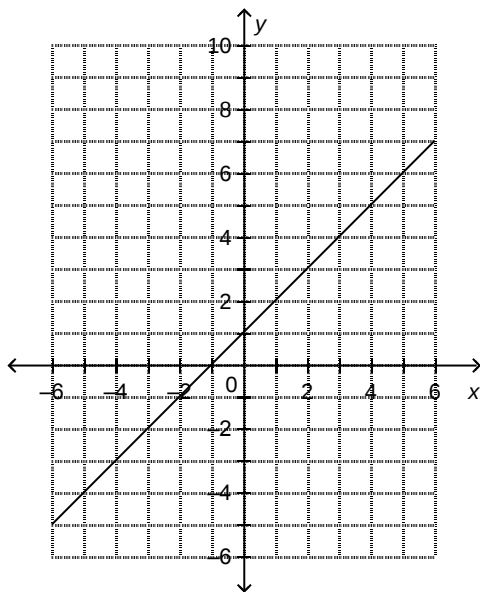
___ 13. Which equation describes the graph below?

i) $x + y = -1$

ii) $x - y = -1$

iii) $x + y = 1$

iv) $x - y = 1$



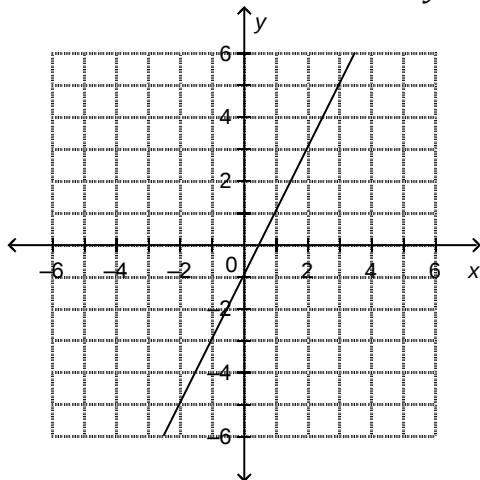
a. iii

b. i

c. ii

d. iv

14. This graph represents a linear relation. Determine the value of x when $y = -2$.



a. -1

b. -0.5

c. 0.5

d. -1.5

15. Name the coefficients of the variable in the polynomial $-4x^2 + 10x - 12$.

a. -4

b. -4, 10

c. -4, -12

d. 4, 10

16. Add: $(6x^2 - 3x) + (-4 - 2x^2)$

a. $4x^2 - 5x - 4$

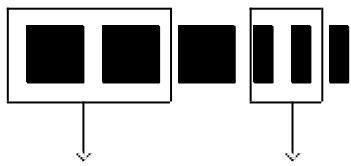
c. $4x^2 - 3x + 4$

b. $6x^2 + 2x - 3x$

d. $4x^2 - 3x - 4$

17. A large black square represents a x^2 -tile and a black rectangle represents a x -tile.

Write the subtraction sentence that these algebra tiles represent.



a. $(-2x^2 - 3x) - (-3x^2 - 2x)$

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

c. $(-2x^2 - 2x) - (-3x^2 - 3x)$

d. $(-3x^2 - 3x) - (-2x^2 - 2x)$

___ 18. Subtract: $(3y^2 - 5x^2 + 4) - (2x - 8 + 4y^2)$

a. $-1y^2 - 5x^2 - 2x - 4$

b. $3y^2 - 7x^2 + 12$

c. $-4x + 12$

d. $-1y^2 - 5x^2 - 2x + 12$

___ 19. A number times 5, minus 6, is 8. Write an equation to determine the number.

a. $6 - 5x = 8$

b. $5x - 6 = 8$

c. $5 - 6x = 8$

d. $6x - 5 = 8$

___ 20. Which of these inequalities has -4 as a solution?

i) $p + 1 \leq -2$

ii) $q + 2 > -2$

iii) $r - 1 < -4$

iv) $s - 4 \geq -4$

a. ii and iv

b. i and ii

c. i and iii

d. i and iv

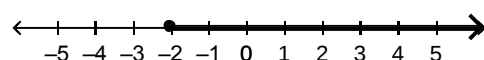
___ 21. The solution to which inequality is graphed on the number line below?

i) $x + 2 \geq 0$

ii) $y - 1 \geq -1$

iii) $z + 2 > 0$

iv) $t - 1 > -1$



a. ii

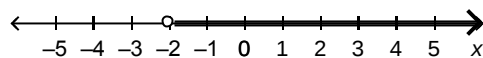
b. iv

c. iii

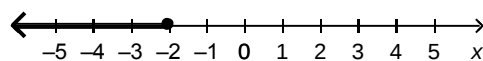
d. i

___ 22. Which of these graphs represent the solution of the inequality $5x \geq -10$?

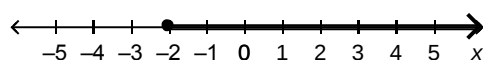
i) .



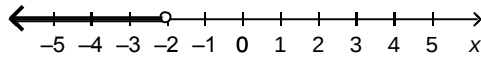
ii) .



iii) .



iv)



a. Graph iii

b. Graph iv

c. Graph ii

d. Graph i

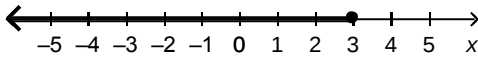
23. Which inequality has its solution graphed on the number line below?

i) $2 + 3x \geq 11$

ii) $3 - 3x \geq 12$

iii) $5 - 3x \leq 14$

iv) $5 + 3x \leq 14$



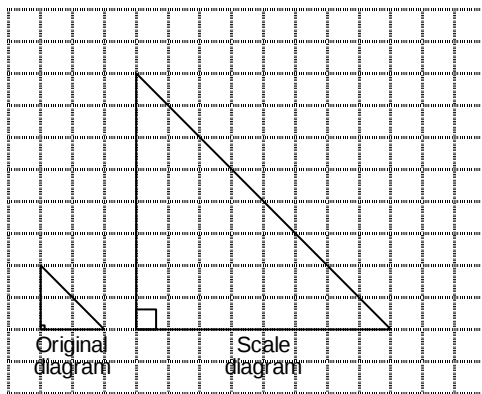
a. i

b. ii

c. iv

d. ii

24. Determine the scale factor for this scale diagram.



a. 32

b. 8

c. 4

d. $\frac{1}{4}$

25. A circle has diameter 56 cm. The diameter of the reduction is 7 cm. Determine the scale factor.

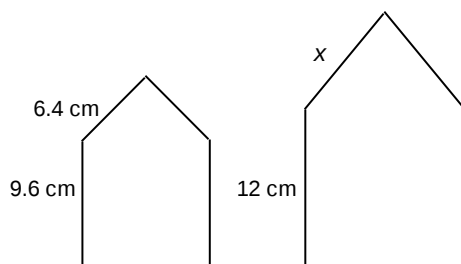
a. $\frac{1}{8}$

b. 8

c. $\frac{1}{49}$

d. 49

26. These two pentagons are similar. Determine the value of x .



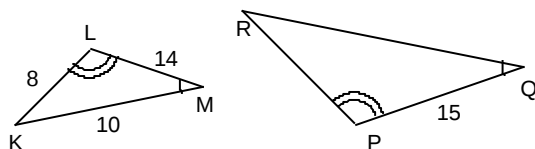
a. 8 cm

b. 1.9 cm

c. 5.12 cm

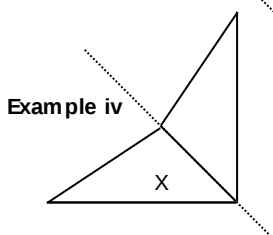
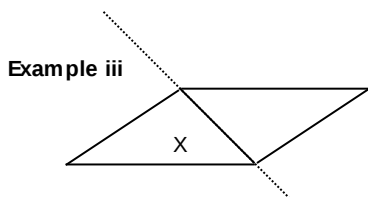
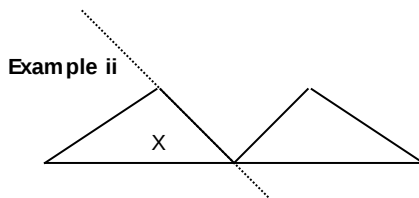
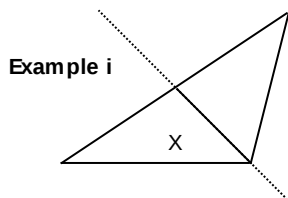
d. 18 cm

___ 27. These triangles are similar. Determine the length of QR to the nearest tenth.



- a. 10.7 b. 12 c. 26.3 d. 18.8

___ 28. Which example shows a reflection of triangle X in the dotted line?

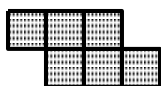


- a. Example iii c. Example ii
b. Example i d. Example iv

___ 29. The angle of rotation symmetry for a shape is 60° . What is the order of rotational symmetry?

a. 6 b. 4 c. 3 d. 8

___ 30. Describe the rotational symmetry and line symmetry of this diagram.



- a. Rotational symmetry of order 2 about the centre; 1 line of symmetry through the centre
b. Rotational symmetry of order 2 about the centre; no line symmetry
c. No rotational symmetry; no line symmetry
d. Rotational symmetry of order 2 about the centre; 2 lines of symmetry through the centre

___ 31. Which of the following letters have both rotational symmetry and line symmetry?

H K N O S X

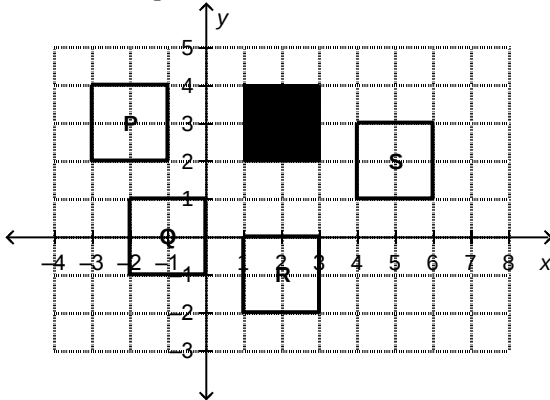
a. H, O, X

b. K, H, X

c. N, H, X

d. S, H, O, X

___ 32. Which of squares P, Q, R, and S are related to the shaded square by line symmetry?



a. Squares P, R, and S

b. Squares P, Q, R, and S

c. Squares P and R

d. Squares P, Q, and R

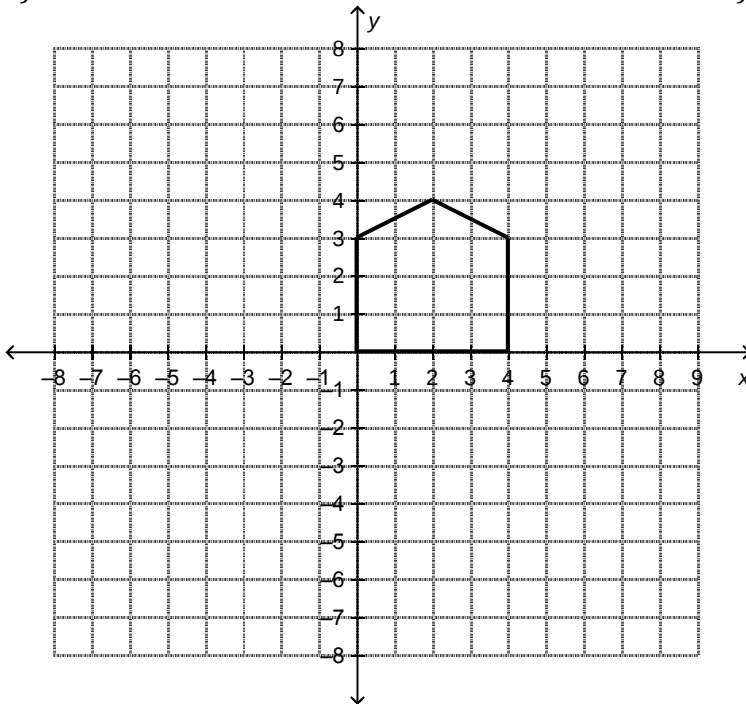
___ 33. Which translations of the pentagon below will result in a diagram of the pentagon and its image with line symmetry?

i) L6

ii) D5

iii) R2

iv) U3



a. D5 and U3

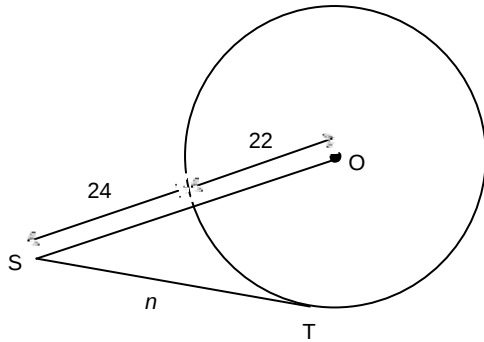
b. R2 and U3

c. L6 and D5

d. L6 and R2

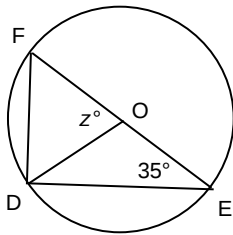
___ 34. O is the centre of this circle and point T is a point of tangency.

Determine the value of n . If necessary, give your answer to the nearest tenth.



- a. 5.7 b. 51 c. 24 d. 40.4

35. O is the centre of this circle.
Determine the value of z° .



- a. 55° c. 90°
b. 110° d. 70°

36. 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 combination of theoretical and experimental probability
 - Theoretical probability
 - Experimental probability
 - Subjective judgment
37. Haley will not go on a cruise because the boat may sink even though cruise ships are very rarely involved in accidents.
Is her decision based on theoretical probability, experimental probability, or subjective judgment?
- Subjective judgment
 - Experimental probability
 - A combination of theoretical and experimental probability
 - Theoretical probability
38. Omar asked his classmates the following question.
"Don't you think apartment buildings should allow residents to have cats?"

Which of the following might be a problem with his survey?

- i) Timing
- ii) Bias
- iii) Privacy
- iv) Cost

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

39. A company hires students to fill boxes with cartons of fruit juice. The quality control manager wants to ensure each box contains the same number of each type of juice. For each student, the manager randomly selects and checks a box that the student filled.
- a. Cluster sampling
 - b. Stratified random sampling
 - c. Systematic sampling
 - d. Convenience sampling
40. The administrator of a dance and fitness studio wants to know if there is interest in having more evening classes available. He surveys everyone who participates in yoga classes to see what they think. Which sampling method does he use?
- a. Self-selected sampling
 - b. Stratified random sampling
 - c. Simple random sampling
 - d. Cluster sampling

Short Answer

41. Write $[7 \times (-8) \times 9]^3$ as a product of powers.

42. Evaluate this expression.

$$\frac{11}{2} - \frac{7}{5} + \frac{13}{4}$$

43. Determine a rational number that makes this statement true.

$$\square - 11.8 \leq -7.7$$

44. Here is a pattern made with toothpicks.
The pattern continues.



Figure 1

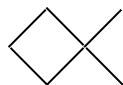


Figure 2

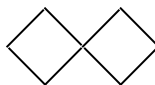
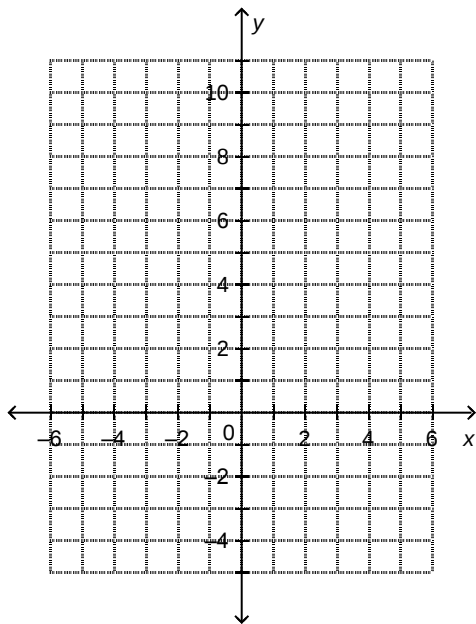


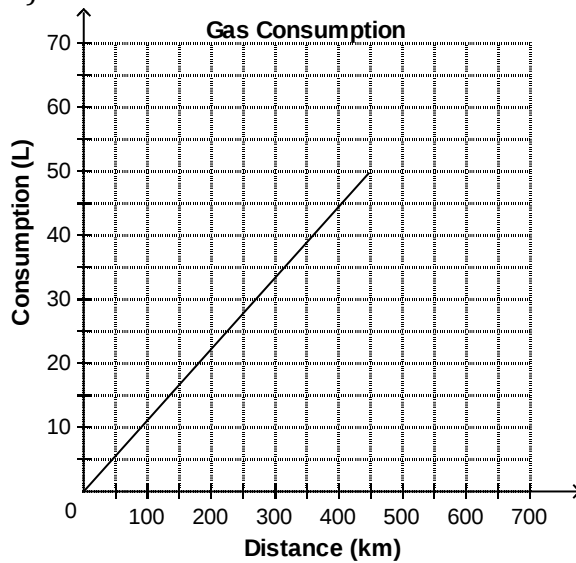
Figure 3

- a) Write an equation that relates the number of toothpicks, N , to the figure number, n .
 - b) How many toothpicks are needed for figure 80?
45. A helicopter is at a height of 1600 m when it starts descending to land. The helicopter's height changes at an average rate of 140 m/min.
- a) Write an equation that relates the height of the helicopter, H metres, to the time since the helicopter began its descent, t minutes.
 - b) What is the height of the helicopter 9 min after it began its descent?
46. Graph the following lines on the same grid. Label the lines.
- i) $x + y = 4$

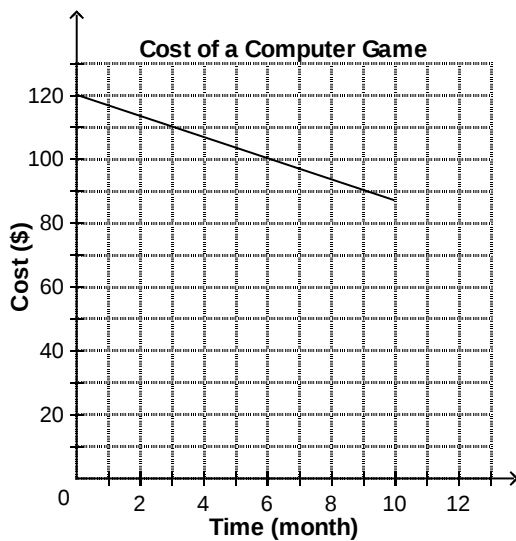
ii) $x - y = -4$



47. This graph shows the gas consumption rate of a car.
- Estimate the volume of gas required to travel 630 km.
 - Estimate the distance the car can travel on 60 L of gas.



48. This graph shows how the cost of a new computer game changes with time. Estimate the cost of the game 12 months after it is released.



49. A large white square represents an x^2 -tile, a large black square represents a $-x^2$ -tile, a white rectangle represents an 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.

Match each polynomial with its corresponding algebra tile model.

i) $3 - 2t + 4t^2$

ii) $3a^2 - 6$

iii) $4s - 7 - 2s^2$

iv) $5m^2$

v) $-3p + 8$

vi) $-4c^2 + 6c - 2$

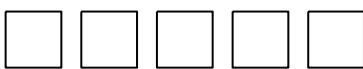
Model A



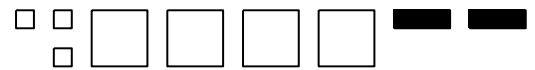
Model B



Model C



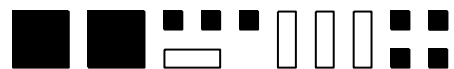
Model D



Model E



Model F



50. According to the weather forecast, there is an 80% chance of sunshine tomorrow.

Lei plans to go rollerblading tomorrow.

Explain how Lei's decision to go rollerblading could be based on:

- Probability
- Subjective judgment

Provincial Achievement Testing 2011 Answer Key

MULTIPLE CHOICE

1. ANS: A PTS: 1 DIF: Easy REF: 1.1 Square Roots of Perfect Squares
LOC: 9.N5 TOP: Number KEY: Procedural Knowledge
2. ANS: B PTS: 1 DIF: Easy
REF: 2.2 Powers of Ten and the Zero Exponent LOC: 9.N1
TOP: Number KEY: Procedural Knowledge
3. ANS: C PTS: 1 DIF: Moderate REF: 2.5 Exponent Laws II
LOC: 9.N2 TOP: Number KEY: Procedural Knowledge
4. ANS: A PTS: 1 DIF: Moderate REF: 2.5 Exponent Laws II
LOC: 9.N2 TOP: Number KEY: Conceptual Understanding
5. ANS: C PTS: 1 DIF: Easy REF: 3.1 What Is a Rational Number?
LOC: 9.N3 TOP: Number KEY: Conceptual Understanding
6. ANS: B PTS: 1 DIF: Easy REF: 3.1 What Is a Rational Number?
LOC: 9.N3 TOP: Number KEY: Conceptual Understanding
7. ANS: D PTS: 1 DIF: Easy REF: 3.2 Adding Rational Numbers
LOC: 9.N3 TOP: Number KEY: Procedural Knowledge
8. ANS: D PTS: 1 DIF: Moderate REF: 3.2 Adding Rational Numbers
LOC: 9.N3 TOP: Number KEY: Conceptual Understanding
9. ANS: D PTS: 1 DIF: Easy REF: 3.3 Subtracting Rational Numbers
LOC: 9.N3 TOP: Number KEY: Conceptual Understanding
10. ANS: C PTS: 1 DIF: Easy REF: 3.5 Dividing Rational Numbers
LOC: 9.N3 TOP: Number KEY: Procedural Knowledge
11. ANS: A PTS: 1 DIF: Easy
REF: 3.6 Order of Operations with Rational Numbers LOC: 9.N4
TOP: Number KEY: Procedural Knowledge
12. ANS: D 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: Conceptual Understanding
13. ANS: C PTS: 1 DIF: Moderate REF: 4.4 Matching Equations and Graphs
LOC: 9.PR2 TOP: Patterns and Relations (Patterns) KEY: Procedural Knowledge
14. 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
15. ANS: B PTS: 1 DIF: Easy REF: 5.1 Modelling Polynomials
LOC: 9.PR5 TOP: Patterns and Relations (Variables and Equations)
KEY: Conceptual Understanding

16. ANS: D PTS: 1 DIF: Moderate REF: 5.3 Adding Polynomials
 LOC: 9.PR6 TOP: Patterns and Relations (Variables and Equations)
 KEY: Procedural Knowledge
17. ANS: D PTS: 1 DIF: Easy REF: 5.4 Subtracting Polynomials
 LOC: 9.PR6 TOP: Patterns and Relations (Variables and Equations)
 KEY: Procedural Knowledge
18. ANS: D PTS: 1 DIF: Difficult REF: 5.4 Subtracting Polynomials
 LOC: 9.PR6 TOP: Patterns and Relations (Variables and Equations)
 KEY: Procedural Knowledge
19. ANS: B PTS: 1 DIF: Easy
 REF: 6.2 Solving Equations by Using Balance Strategies LOC: 9.PR3
 TOP: Patterns and Relations (Variables and Equations)
 KEY: Conceptual Understanding | Procedural Knowledge
20. ANS: C PTS: 1 DIF: Easy
 REF: 6.4 Solving Linear Inequalities by Using Addition and Subtraction
 LOC: 9.PR4 TOP: Patterns and Relations (Variables and Equations)
 KEY: Procedural Knowledge
21. ANS: D PTS: 1 DIF: Easy
 REF: 6.4 Solving Linear Inequalities by Using Addition and Subtraction
 LOC: 9.PR4 TOP: Patterns and Relations (Variables and Equations)
 KEY: Procedural Knowledge
22. ANS: A PTS: 1 DIF: Easy
 REF: 6.5 Solving Linear Inequalities by Using Multiplication and Division
 LOC: 9.PR4 TOP: Patterns and Relations (Variables and Equations)
 KEY: Procedural Knowledge
23. ANS: C PTS: 1 DIF: Easy
 REF: 6.5 Solving Linear Inequalities by Using Multiplication and Division
 LOC: 9.PR4 TOP: Patterns and Relations (Variables and Equations)
 KEY: Procedural Knowledge
24. ANS: C PTS: 1 DIF: Easy
 REF: 7.1 Scale Diagrams and Enlargements LOC: 9.SS4
 TOP: Shape and Space (Transformations) KEY: Procedural Knowledge
25. ANS: A PTS: 1 DIF: Easy REF: 7.2 Scale Diagrams and Reductions
 LOC: 9.SS4 TOP: Shape and Space (Transformations)
 KEY: Procedural Knowledge
26. ANS: A PTS: 1 DIF: Moderate REF: 7.3 Similar Polygons
 LOC: 9.SS3 TOP: Shape and Space (3-D Objects and 2-D Shapes)
 KEY: Procedural Knowledge
27. ANS: A PTS: 1 DIF: Easy REF: 7.4 Similar Triangles
 LOC: 9.SS3 TOP: Shape and Space (3-D Objects and 2-D Shapes)
 KEY: Procedural Knowledge
28. ANS: D PTS: 1 DIF: Easy REF: 7.5 Reflections and Line Symmetry

LOC: 9.SS5 TOP: Shape and Space (Transformations)
KEY: Procedural Knowledge

29. ANS: A PTS: 1 DIF: Easy
REF: 7.6 Rotations and Rotational Symmetry LOC: 9.SS5
TOP: Shape and Space (Transformations) KEY: Procedural Knowledge
30. ANS: B PTS: 1 DIF: Easy
REF: 7.7 Identifying Types of Symmetry on the Cartesian Plane
LOC: 9.SS5 TOP: Shape and Space (Transformations)
KEY: Procedural Knowledge
31. ANS: A PTS: 1 DIF: Easy
REF: 7.7 Identifying Types of Symmetry on the Cartesian Plane
LOC: 9.SS5 TOP: Shape and Space (Transformations)
KEY: Procedural Knowledge
32. ANS: D PTS: 1 DIF: Easy
REF: 7.7 Identifying Types of Symmetry on the Cartesian Plane
LOC: 9.SS5 TOP: Shape and Space (Transformations)
KEY: Procedural Knowledge
33. ANS: D PTS: 1 DIF: Moderate
REF: 7.7 Identifying Types of Symmetry on the Cartesian Plane
LOC: 9.SS5 TOP: Shape and Space (Transformations)
KEY: Procedural Knowledge
34. ANS: D PTS: 1 DIF: Moderate
REF: 8.1 Properties of Tangents to a Circle LOC: 9.SS1
TOP: Shape and Space (Measurement) KEY: Conceptual Understanding
35. ANS: D PTS: 1 DIF: Moderate REF: 8.3 Properties of Angles in a Circle
LOC: 9.SS1 TOP: Shape and Space (Measurement) KEY: Conceptual Understanding
36. ANS: B PTS: 1 DIF: Easy REF: 9.1 Probability in Society
LOC: 9.SP4 TOP: Statistics and Probability (Chance and Uncertainty)
KEY: Conceptual Understanding
37. ANS: A PTS: 1 DIF: Easy REF: 9.1 Probability in Society
LOC: 9.SP4 TOP: Statistics and Probability (Chance and Uncertainty)
KEY: Conceptual Understanding
38. ANS: C PTS: 1 DIF: Easy
REF: 9.2 Potential Problems with Collecting Data LOC: 9.SP1
TOP: Statistics and Probability (Data Analysis) KEY: Conceptual Understanding
39. ANS: B PTS: 1 DIF: Easy REF: 9.4 Selecting a Sample
LOC: 9.SP2 TOP: Statistics and Probability (Data Analysis)
KEY: Conceptual Understanding
40. ANS: D PTS: 1 DIF: Easy REF: 9.4 Selecting a Sample
LOC: 9.SP2 TOP: Statistics and Probability (Data Analysis)
KEY: Conceptual Understanding

SHORT ANSWER

41. ANS:

$$7^3 \times (-8)^3 \times 9^3$$

PTS: 1

DIF: Easy

REF: 2.5 Exponent Laws II

LOC: 9.N2

TOP: Number

KEY: Procedural Knowledge

42. ANS:

73

20

PTS: 1

DIF: Difficult

REF: 3.3 Subtracting Rational Numbers

LOC: 9.N3

TOP: Number

KEY: Procedural Knowledge

43. ANS:

Any rational number less than or equal to 4.1.

PTS: 1

DIF: Difficult

REF: 3.3 Subtracting Rational Numbers

LOC: 9.N3

TOP: Number

KEY: Procedural Knowledge | Problem-Solving Skills

44. ANS:

a) $N = 2n + 2$

b) 162

PTS: 1

DIF: Moderate

REF: 4.1 Writing Equations to Describe Patterns

LOC: 9.PR1

TOP: Patterns and Relations (Patterns)

KEY: Conceptual Understanding | Procedural Knowledge

45. ANS:

a) $H = 1600 - 140t$

b) 340 m

PTS: 1

DIF: Moderate

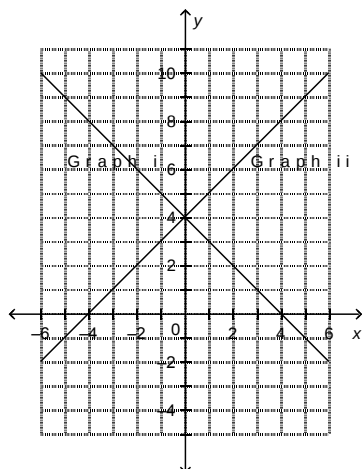
REF: 4.2 Linear Relations

LOC: 9.PR2

TOP: Patterns and Relations (Patterns)

KEY: Conceptual Understanding | Procedural Knowledge

46. ANS:



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

47. ANS:

- a) 70 L
- b) 540 km

PTS: 1

DIF: Moderate REF: 4.5 Using Graphs to Estimate Values

LOC: 9.PR2

TOP: Patterns and Relations (Patterns) KEY: Procedural Knowledge

48. ANS:

\$80

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:

Model A: v

Model B: vi

Model C: iv

Model D: i

Model E: ii

Model F: iii

PTS: 1

DIF: Moderate REF: 5.1 Modelling Polynomials

LOC: 9.PR5

TOP: Patterns and Relations (Variables and Equations)

KEY: Procedural Knowledge

50. ANS:

Answers will vary. For example:

- a) The probability of rain suggests it will be good weather for rollerblading.
- b) Lei may plan to go rollerblading even if it rains.

PTS: 1

DIF: Moderate REF: 9.1 Probability in Society

LOC: 9.SP4

TOP: Statistics and Probability (Chance and Uncertainty)

KEY: Conceptual Understanding