Math 20-1 Year End Review

Chapter 1 Sequences & Series

____ **1.** Which of the following numbers occurs in the sequence –12, –8, –4, 0, 4, . . .?

A 6 **C** 24
B –3 **D** 15

____ **2.** The common difference in the arithmetic sequence 2, –6, –14, –22, . . . is

A –8 **C** –16
B –3 **D** 8

____ **3.** The common difference in the arithmetic sequence $\frac{1}{2}, \frac{5}{6}, \frac{7}{6}, \frac{3}{2}, \frac{11}{6}, \ldots$ is

A $\frac{5}{12}$ **C** 9
B 3 **D** $\frac{1}{3}$

____ **4.** In the formula for the general term of an arithmetic sequence $t_n = -7 + (n - 1) \times (-2.5)$, the common difference is

A 17.5 **C** –4.5
B –7 **D** –2.5

____ **5.** Which of the given formulas for the general term of the sequence –9, –1, 7, 15, 23, . . . is correct?

A $t_n = -8n - 17$ **C** $t_n = 8n - 1$
B $t_n = 8n - 17$ **D** $t_n = -8n - 1$

____ **6.** What is the 18th term of the sequence –22, –21.2, –20.4, –19.6, –18.8, …?

A –6.8 **C** –8.4
B 0.8 **D** –35.6

____ **7.** The sum of the series (–5) + (–7) + (–9) + ··· + (–19) is

A –96 **C** –192
B –304 **D** 26

____ **8.** The sum of an arithmetic series where $t_1 = -2$, $t_3 = 7$, and $n = 15$ is

A –502.5 **C** 476.25
B 442.5 **D** 885

____ **9.** The sum of an arithmetic series where $t_1 = \frac{1}{2}$, $d = 3$, and $n = 19$ is

A 551
B $\frac{165}{2}$
C $\frac{1045}{2}$
D 1045

____ **10.** For the arithmetic series (107) + (130) + (153) + ⋯ + (981), the values of t_1, d, and n are

A $t_1 = 107$, $d = 23$, $n = 39$
B $t_1 = 107$, $d = -23$, $n = 39$
C $t_1 = -107$, $d = 23$, $n = 38$
D $t_1 = -107$, $d = -23$, $n = 38$

____ **11.** On the first day of the month, Michael places 5¢ in a jar. The next day, he places 7¢ in the jar. The third day, he places 9¢ in the jar, and so on for 24 days. What amount will be in the jar at the end of this period of time?

A $6.72
B $6.36
C $6.96
D $6.12

____ **12.** The common ratio for the geometric sequence 8, 1, 0.125, 0.015625, . . . is

A $\frac{1}{8}$
B –8
C 8
D $-\frac{1}{8}$

____ **13.** The population of a community was 82 000 at the beginning of 2000. Assuming a rate of growth of 1.6% per year since 2000, what will the population be at the beginning of 2025?

A 123 894
B 2 082 800
C 121 943
D 120 023

____ **14.** In the formula for the general term of a geometric sequence $t_n = -10\left(\frac{4}{5}\right)^{n-1}$, the common ratio is

A $\frac{5}{4}$
B 5
C 4
D $\frac{4}{5}$

____ **15.** The eighth term in the sequence 3 515 625, 703 125, 140 625, 28 125, … is

A 9
B $\frac{1}{9}$
C 45
D 5

____ **16.** The 6th term in the sequence $\frac{4}{7}, 1, \frac{7}{4}, \frac{49}{16}, \ldots$ is

A $\frac{2401}{4096}$
B $\frac{2401}{256}$
C $\frac{256}{2401}$
D $\frac{117649}{4096}$

____ **17.** The first three terms of the sequence given by $t_n = 11\left(\frac{1}{4}\right)^{n-1}$ are

A 11, 121, 1331

B $11, \frac{11}{4}, \frac{11}{16}$

C $\frac{11}{4}, \frac{11}{16}, \frac{11}{64}$

D $11, \frac{11}{3}, \frac{11}{9}$

____ **18.** How many terms are in the sequence 2, 8, 32, 128, 512, …, 2 097 152?

A 9

B 12

C 10

D 11

____ **19.** The sum of a geometric series where $t_1 = \frac{1}{3}$, $r = 2$, and $n = 3$ is approximately

A 2.3

B 1.3

C 2.7

D 1.2

____ **20.** The sum of the geometric series $14 + 70 + 350 + \cdots + 43\,750$ is

A 8747

B 10 938

C 54 688

D 54 684

____ **21.** The sum of the geometric series $13 + 6.5 + 3.25 + \cdots + 0.203125$ is

A $\frac{559}{64}$

B $\frac{1677}{64}$

C $\frac{1651}{64}$

D $\frac{819}{32}$

____ **22.** The 6th term of the geometric series $256 + 128 + 64 + \cdots$ is

A $\frac{64}{9}$

B 4

C 8

D 2

____ **23.** What is the value of S_9 for the series $8 - 24 + 72 - 216 + \cdots$?

A 39 366

B –13 122

C 52 491

D 39 368

____ **24.** If you researched your ancestors back 16 generations, how many people would you need to research?

A 262 140

B 131 070

C 65 535

D 131 069

____ **25.** Determine the sum of the infinite geometric series $11 + \frac{11}{3} + \frac{11}{9} + \frac{11}{27} + \ldots$

A 33

B $\frac{33}{4}$

C $\frac{33}{2}$

D $\frac{440}{27}$

____ **26.** What is the sum of the infinite geometric series
$15 + 15(8/9) + 15(8/9)^2 + 15(8/9)^3 + \cdots$?

A -120
B $\frac{135}{17}$
C $\frac{135}{8}$
D 135

____ **27.** Determine the sum of the infinite geometric series with $t_1 = 2$ and $r = \frac{1}{5}$.

A $\frac{1}{3}$
B $\frac{5}{3}$
C $\frac{-1}{2}$
D $\frac{5}{2}$

____ **28.** The sum of an infinite geometric series is $\frac{20}{3}$ and its common ratio is $\frac{1}{4}$. What is the first term of the series?

A $\frac{1}{4}$
B 5
C $\frac{80}{3}$
D $\frac{5}{3}$

____ **29.** Which of the following best describes the series $-50 + -45 + \left(-\frac{81}{2}\right) + \left(-\frac{729}{80}\right) + \ldots$?

A The series is convergent and has a sum of –500.
B The series is divergent and has a sum of –500.
C The series is divergent and has no sum.
D The series is convergent and has no sum.

____ **30.** The first three terms of the sequence defined by $t_n = -0.3n + 0.5$ are

A 0.5, 0.8, 1.1
B –0.3, 0.2, 0.7
C 0.2, –0.1, –0.4
D –0.3, –0.8, –1.3

Chapter 2 Trigonometry

____ **31.** What is the reference angle for 15° in standard position?

A 255°
B 30°
C 345°
D 15°

____ **32.** What is the reference angle for 200° in standard position?

A 100°
B 70°
C 20°
D 110°

____ **33.** What are the three other angles in standard position that have a reference angle of 54°?

A 99°, 144°, 234°
B 108°, 162°, 216°
C 144°, 234°, 324°
D 126°, 234°, 306°

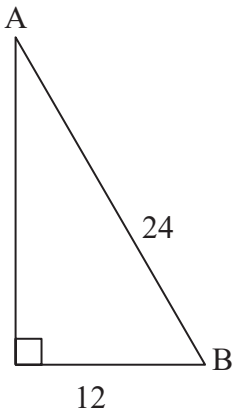
____ **34.** What is the exact sine of ∠A?

A $\frac{\sqrt{3}}{3}$

B $\frac{1}{3}$

C $\frac{2}{\sqrt{3}}$

D $\frac{1}{2}$



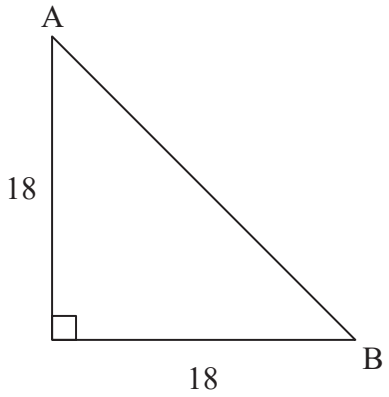
____ **35.** What is the exact cosine of ∠A?

A $\sqrt{2}$

B 1

C 18

D $\frac{1}{\sqrt{2}}$



____ **36.** Which set of angles has the same terminal arm as 40°?

A 80°, 120°, 160°

B 130°, 220°, 310°

C 200°, 380°, 560°

D 400°, 760°, 1120°

____ **37.** The point (40, –9) is on the terminal arm of ∠A. Which is the set of exact primary trigonometric ratios for the angle?

A $\sin A = -\frac{41}{9},\ \cos A = \frac{41}{40},\ \tan A = -\frac{9}{40}$

B $\sin A = \frac{40}{41},\ \cos A = -\frac{9}{41},\ \tan A = -\frac{40}{9}$

C $\sin A = -\frac{40}{41},\ \cos A = \frac{9}{41},\ \tan A = -\frac{9}{40}$

D $\sin A = -\frac{9}{41},\ \cos A = \frac{40}{41},\ \tan A = -\frac{9}{40}$

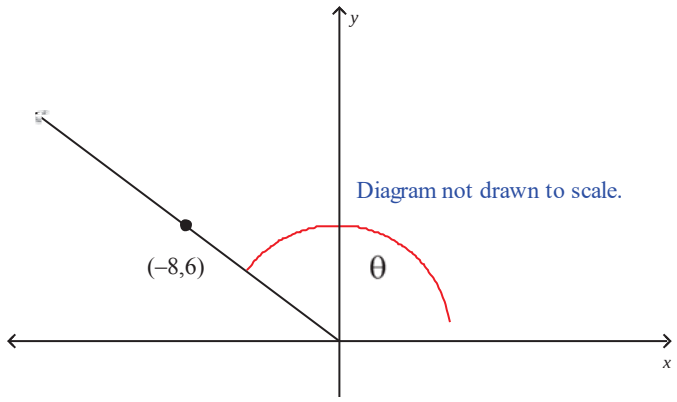
____ **38.** The coordinates of a point P on the terminal arm of an angle are shown. What are the exact trigonometric ratios for $\sin\theta$, $\cos\theta$, and $\tan\theta$?

A $\sin A = -\frac{4}{5},\ \cos A = \frac{3}{5},\ \tan A = -\frac{4}{3}$

B $\sin A = \frac{5}{3},\ \cos A = -\frac{5}{4},\ \tan A = -\frac{3}{4}$

C $\sin A = \frac{3}{5},\ \cos A = -\frac{4}{5},\ \tan A = -\frac{3}{4}$

D $\sin A = \frac{4}{5},\ \cos A = -\frac{3}{5},\ \tan A = -\frac{3}{4}$



____ **39.** Marco is 450 m due east of the centre of the park. His friend Ray is 450 m due south of the centre of the park. Which is the correct expression for the exact distance between the two boys?

A $225\sqrt{2}$ m

B $\frac{225}{\sqrt{2}}$ m

C $450\sqrt{2}$ m

D $\frac{450}{\sqrt{2}}$ m

____ **40.** What is the exact value for $\tan(240°)$?

A $\frac{1}{\sqrt{3}}$

B $-\sqrt{3}$

C 1

D $\sqrt{3}$

____ **41.** An angle is in standard position such that $\cos\theta = \frac{1}{9}$. What are the possible values of θ, to the nearest degree, if $0° \le \theta \le 360°$?

A 6° and 174°

B 6° and 276°

C 84° and 264°

D 84° and 276°

____ **42.** Solve to the nearest tenth of a unit for the unknown side in the ratio $\frac{a}{\sin 30°} = \frac{12}{\sin 115°}$.

A 24

B 21.8

C 6.6

D 24.6

____ **43.** Determine the length of *x*, to the nearest tenth of a centimetre.

A 26.6

B 36.5

C 11.2

D 17.1

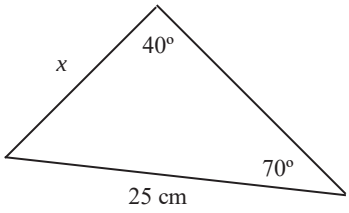
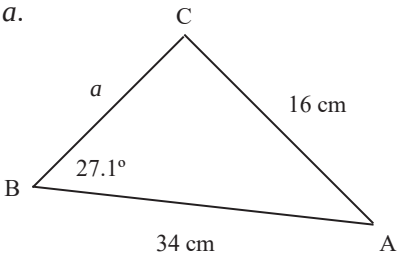


Diagram not drawn to scale.

____ **44.** Determine, to the nearest tenth of a centimetre, the two possible lengths of a.

A 72.8 cm and 26.3 cm
B 34.3 cm and 26.3 cm
C 72.8 cm and 55.8 cm
D 55.8 cm and 34.3 cm



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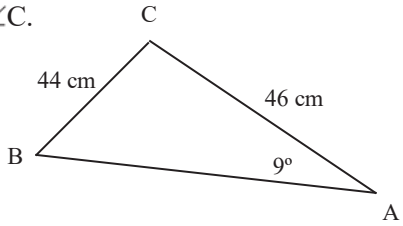
____ **45.** Determine, to the nearest tenth of a degree, the two possible measures of ∠C.

A 9° and 81°
B 161.6° and 171°
C 161.6° and 0.4°
D 9° and 171°



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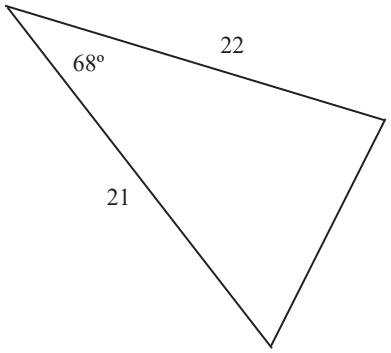
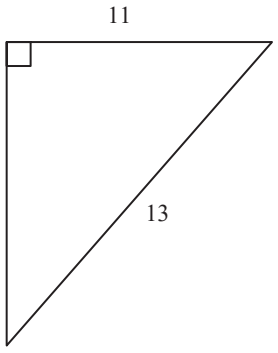
____ **46.** Which of the following triangles **cannot** be solved using the sine law?

Diagrams not drawn to scale.

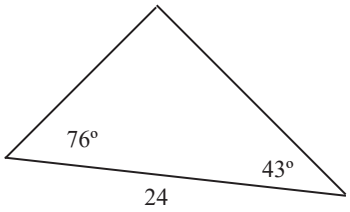
A



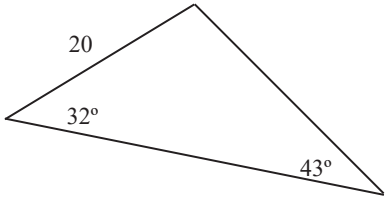
B



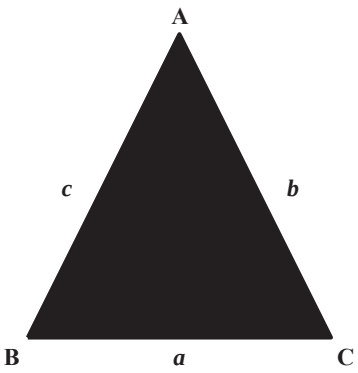
C



D



____ **47.** If $\angle B = 58.8°$, $c = 10.3$ cm, and $b = 10.5$ cm, and ΔABC is acute, what is the measure of $\angle C$, to the nearest tenth of a degree?



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A 57°
B 123.0°
C 30.5°
D 149.5°

____ **48.** Which strategy would be best to solve for x in the triangle shown?

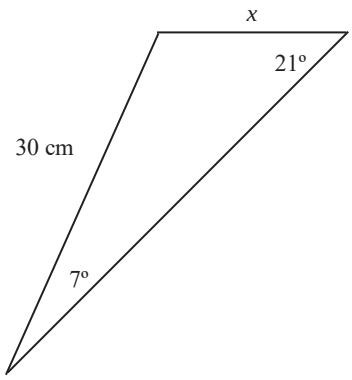
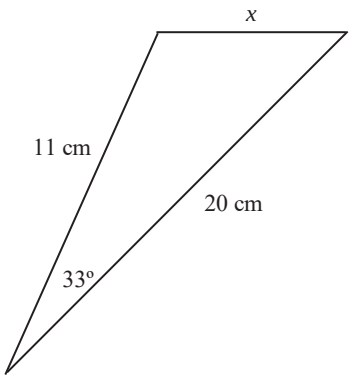


Diagram not drawn to scale.

A cosine law
B primary trigonometric ratios
C sine law
D none of the above

____ **49.** Which strategy would be best to use to solve for x?



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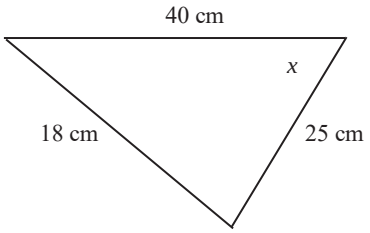
A primary trigonometric ratios
B sine law
C cosine law
D none of the above

____ **50.** Determine the measure of x, to the nearest tenth of a degree.



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A 25.6°
B 18.1°
C 136.3°
D 71.9°

____ **51.** What is the length of x, to the nearest tenth of a metre?

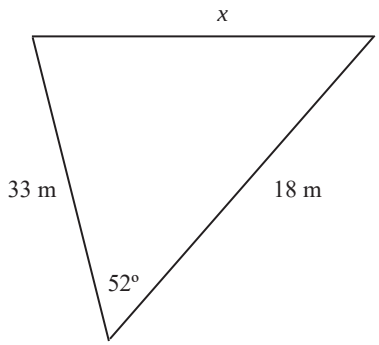
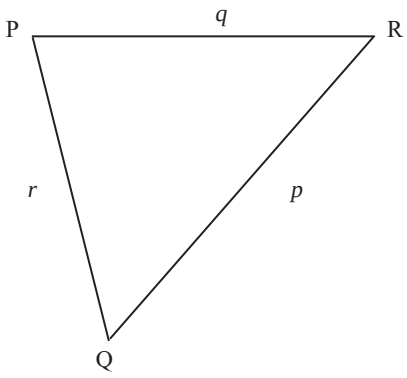


Diagram not drawn to scale.

A 27.7 m
B 21.8 m
C 26.1 m
D 37.6 m

____ **52.** If $\angle Q = 31°$, $r = 20$ cm, and $p = 23$ cm, what is the length of q, to the nearest centimetre?



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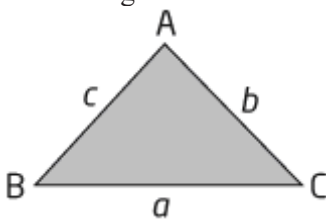
A 21 cm
B 30 cm
C 12 cm
D 11 cm

____ **53.** Solve the following triangle, rounding side lengths to the nearest tenth of a unit and angle measures to the nearest degree.



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$\angle A = 152°$, $b = 19$, $a = 23.5$

A $\angle B = 22°$, $\angle C = 6°$, $c = 5.0$
B $\angle B = 158°$, $\angle C = 84°$, $c = 5.0$
C $\angle B = 68°$, $\angle C = 174°$, $c = 28.7$
D $\angle B = 35°$, $\angle C = 7°$, $c = 28.2$

____ **54.** While flying, a helicopter pilot spots a water tower that is 7.4 km to the north. At the same time, he sees a monument that is 8.5 km to the south. The tower and the monument are separated by a distance of 11.4 km along the flat ground. What is the angle made by the water tower, helicopter, and monument?

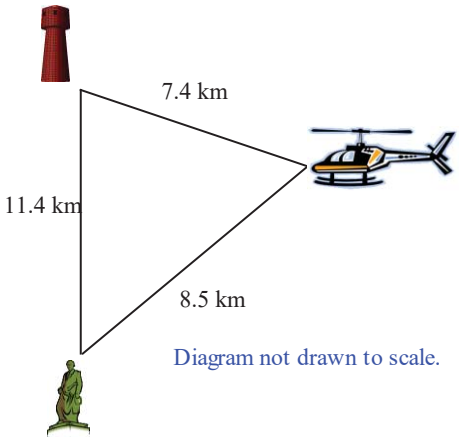


Diagram not drawn to scale.

A 91°
B 11°
C 40°
D 48°

Chapter 3&4 Quadratic Functions and Equations

____ **55.** What are the *x*-intercepts of $y = (x - 6)(y - 9)$?

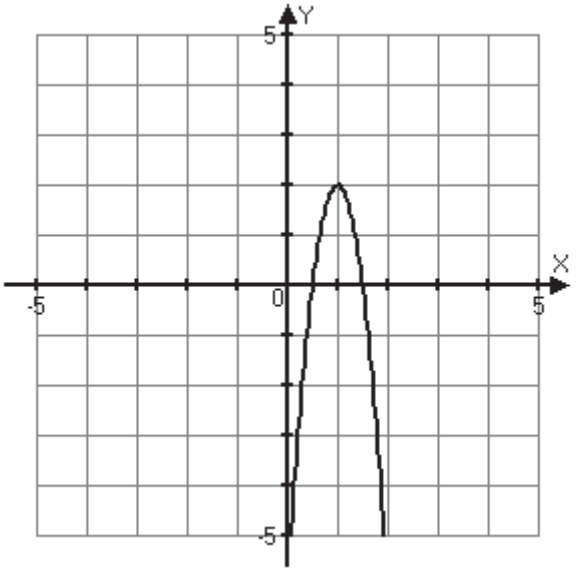
A 6 and 9
B –6 and –9
C –6 and 9
D 6 and –9

____ **56.** What is the axis of symmetry of $f(x) = 2(x + 6)^2 - 3$?

A $x = 2$
B $x = -3$
C $x = -6$
D $x = 6$

____ **57.** What is the quadratic function in vertex form for the parabola shown below?

A $f(x) = -8(x - 2)^2 + 1$
B $f(x) = -8(x - 1)^2 + 2$
C $f(x) = 8(x + 1)^2 + 1$
D $f(x) = 8(x - 1)^2 - 2$

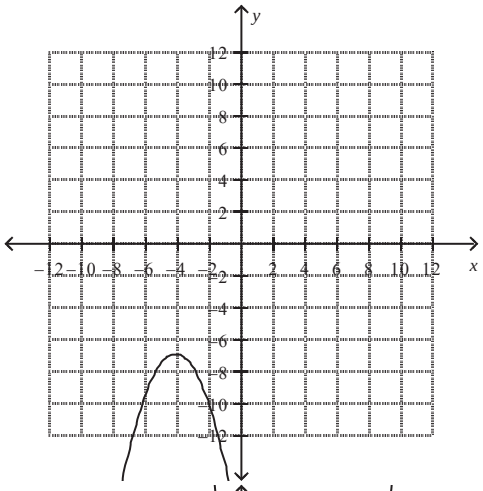


____ **58.** What is the vertex of $y = 7(x + 5)^2 + 4$?

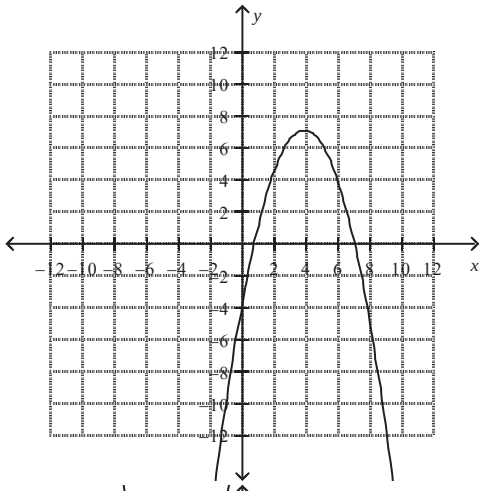
A (5, 4)
B (–4, 5)
C (–5, 4)
D (7, –4)

____ **59.** Which graph represents the quadratic function $y = \frac{5}{7}(x-4)^2 - 7$?

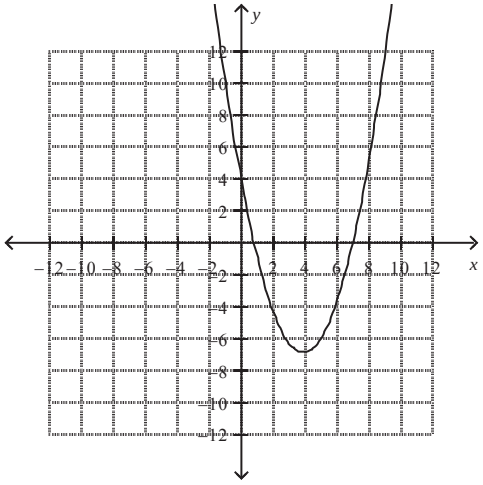
A



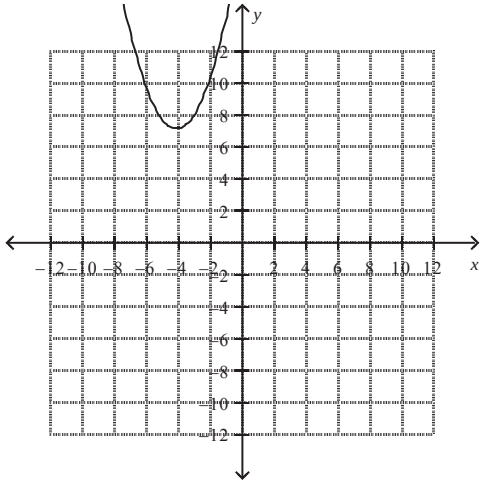
C



B



D



____ **60.** What are the domain and range of $y = 7(x-1)^2 - 9$?

A Domain: $\{x | x \le -1, x \in R\}$
Range: $\{y | y \in R\}$

B Domain: $\{x | x \in R\}$
Range: $\{y | y \ge -9, y \in R\}$

C Domain: $\{x | x \ge 7,\ x \in R\}$
Range: $\{y | y \in R\}$

D Domain: $\{x | x \in R\}$
Range: $\{y | y \le -1, y \in R\}$

____ **61.** The vertex of a parabola is located at $(-5, 6)$. If the parabola has a *y*-intercept of 231, which quadratic function represents the parabola?

A $f(x) = 9(x-5)^2 + 6$

B $f(x) = 9(x+5)^2 + 6$

C $f(x) = -9(x+5)^2 + 6$

D $f(x) = 9(x-5)^2 - 6$

____ **62.** What information can be determined from the quadratic function $f(x) = \frac{2}{3}(x+2)^2 - 9$?

A the vertex is at (–2, –9) and the graph opens upward
B the vertex is at (–9, –2) and the graph opens downward
C the vertex is at (–2, –9) and the graph opens downward
D the vertex is at (–9, –2) and the graph opens upward

____ **63.** Which function is *not* quadratic?

A $f(x) = (6x+9)\left(\frac{1}{9}x - 9\right)$
B $f(x) = x(x-9)(6x+8)$
C $f(x) = 7x^2 + 8$
D $f(x) = 6(x-9)^2$

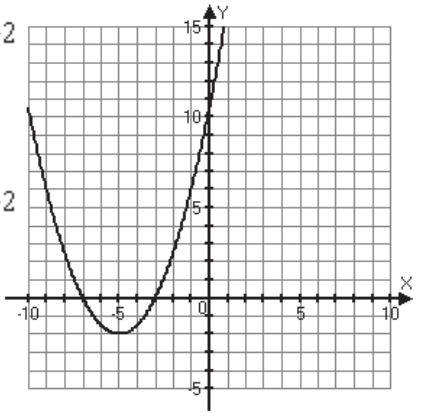
____ **64.** Identify the characteristics of this graph.

A vertex: (–2, –5)
axis of symmetry: $x = -2$
y-intercept: 10.5
x-intercepts: –3 and –7
opens downward

B vertex: (–5, –2)
axis of symmetry: $x = -5$
y-intercept: 10.5
x-intercepts: –3 and –7
opens upward

C vertex: (–2, –5)
axis of symmetry: $x = -2$
y-intercept: 10.5
x-intercepts: –3 and –7
opens upward

D vertex: (–5, –2)
axis of symmetry: $x = -2$
y-intercept: 10.5
x-intercepts: 3 and 7
opens downward



____ **65.** What is $g(x) = (-2x+6)(4x-14)$ written in standard form?

A $g(x) = -8x^2 + 28x + 8$
B $g(x) = -8x^2 + 52x - 84$
C $g(x) = 2x^2 - 8$
D $g(x) = -8x^2 - 84$

____ **66.** What are the coordinates of the vertex of the quadratic function $y = 4x^2 + 8x - 2$?

A (–6, –1)
B (8, –2)
C (–1, –6)
D (8, –6)

____ **67.** What is the function $y = 2(x-4)^2 - 2$ written in standard form?

A $y = 2x^2 - 8x + 30$
B $y = 2x^2 - 8x + 34$
C $y = 2x^2 - 16x + 34$
D $y = 2x^2 - 16x + 30$

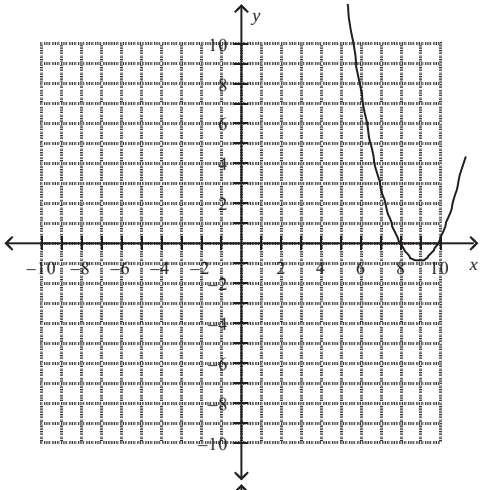
____ **68.** What is the function $y = (x+2)^2$ written in standard form?

A $y = x^2 + 4x + 4$
B $y = x^2 - 4x + 4$
C $y = x^2 - 2^2$
D $y = x^2 + 4$

____ **69.** Which graph represents the quadratic function with the following characteristics:

x-intercepts at 8 and 10
maximum of 1

A



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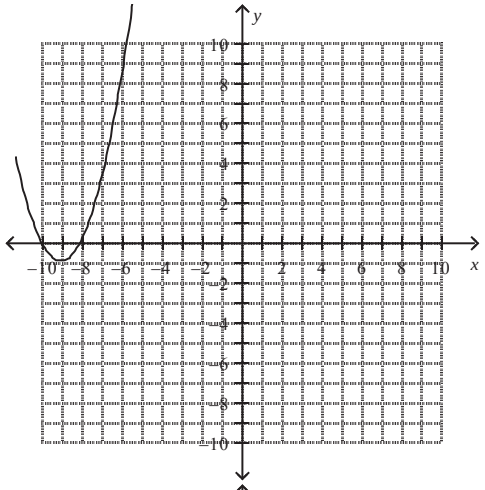

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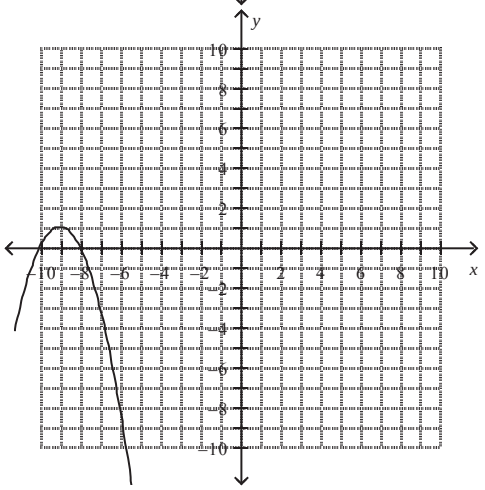

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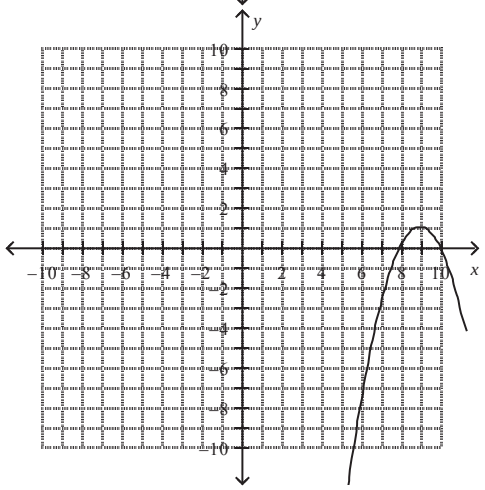


____ **70.** If the points $(-1, 4)$ and $(2, 13)$ are on the graph of the quadratic function $f(x) = 7x^2 + bx + c$, what are the values of *b* and *c*?

A $b = -3$ and $c = -9$
B $b = -7$ and $c = -4$
C $b = 9$ and $c = 3$
D $b = -4$ and $c = -7$

____ **71.** The table shows the path of an extraterrestrial missile, where *x* is the horizontal distance, in metres, from the launch pad and *h* is the height, in metres, of the missile above the launch pad.

Horizontal distance, *x*	Height, *h*
0	4.0
1	8.6
2	12.4
3	15.4
6	19.6
9	16.6
13	1.4

What **quadratic** equation can be used to model the data set?

A $h = -0.4x^2 + 2.5x + 2$
B $h = -0.4x^2 + 5x + 4$
C $h = -0.4x^2 - 5x + 4$
D $h = -0.4x^2 + 5x - 4$

____ **72.** What is the equation of the quadratic function $y = x^2 + 24x + 29$ in vertex form?

A $y = (x + 12)^2 - 173$
B $y = (x - 12)^2 - 115$
C $y = (x - 12)^2 - 173$
D $y = (x + 12)^2 - 115$

____ **73.** What is the equation of the quadratic function $y = x^2 - 26x + 41$ in vertex form?

A $y = -(x + 13)^2 - 210$
B $y = -(x - 13)^2 - 210$
C $y = (x + 13)^2 - 128$
D $y = (x - 13)^2 - 128$

____ **74.** Which quadratic function in standard form represents $y = 3(x - 1)^2 - 25$?

A $y = 3x^2 - 3x - 11$
B $y = 3x^2 - 6x - 22$
C $y = 3x^2 + 6x - 22$
D $y = 3x^2 - 6x - 11$

____ **75.** State whether the function $y = 4x^2 - 36x - 43$ has a maximum or minimum value and identify the coordinates of the vertex.

A maximum at $(4.5, -124)$
B maximum at $(-124, 4.5)$
C minimum at $(-124, 4.5)$
D minimum at $(4.5, -124)$

____ **76.** The vertex of the quadratic function $y = (-7/9)x^2 - (1/6)x - 1/81$ is

A $(-3/28, -31/9072)$
B $(-31/9072, -3/28)$
C $(31/9072, -3/28)$
D $(3/28, -31/9072)$

____ **77.** What is the vertex form of $y = (1/4)x^2 + (1/16)x - 1/64$?

A $\frac{1}{4}(x + 1/8)^2 + \frac{5}{256}$
B $(1/4)(x - 5/256)^2 - 1/8$
C $(1/4)(x + 5/256)^2 + 1/8$
D $(1/4)(x + 1/8)^2 - 5/256$

____ **78.** Convert $y = -2.5x^2 - 36.7x - 5.9$ to vertex form. Round coefficients to two decimal places, if necessary.

A $y = -2.5(x + 7.34)^2 + 128.79$
B $y = -2.5(x - 7.34)^2 + 128.79$
C $y = -2.5(x - 7.34)^2 + 47.98$
D $y = -2.5(x + 7.34)^2 + 47.98$

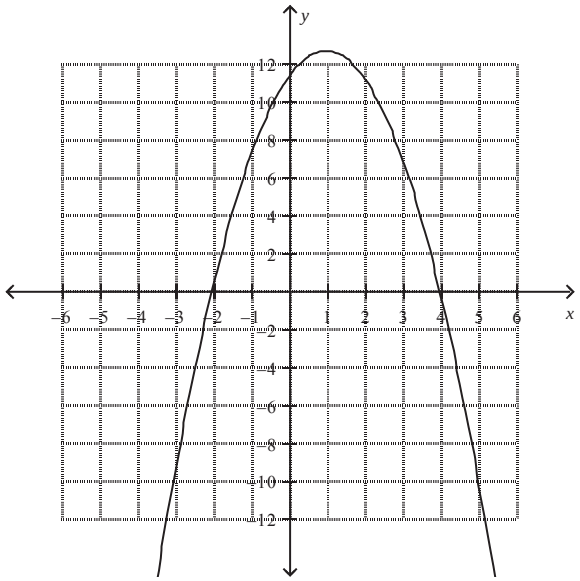
____ **79.** What is the axis of symmetry for the quadratic function $y = (-1/3)x^2 - (1/2)x - 1$?

A $x = -\frac{1}{48}$
B $x = -\frac{117}{4}$
C $x = -\frac{13}{16}$
D $x = -\frac{3}{4}$

____ **80.** How many *x*-intercepts does the graph of the quadratic function $f(x) = -2.3x^2 - 6.9x - 4.6$ have?

A unknown
B 2
C 1
D 0

____ **81.** What are the *x*-intercepts of the quadratic function graphed here?



A 2 and –4
B –2 and 4
C 11.2
D 12.6

____ **82.** What are the *x*-intercepts of the quadratic function $f(x) = 0.3(x - 4.6)^2 + 9.0$?

A 4.6
B there are none
C –2.2
D 9.0

____ **83.** What is the *x*-intercept of the quadratic function $f(x) = 4.8(x-2)^2$?

A 0
B –2
C 4.8
D 2

____ **84.** What are the roots of the quadratic function $y = 0.5x^2 + 3.5x + 6$?

A –0.125
B 4 and 3
C –4 and –3
D 6

____ **85.** What are the roots of the quadratic function $y = -6.1x^2 - 97.6x - 390.4$?

A –8 and 0
B –390.4 and 8
C –8
D 8

____ **86.** Factor $x^2 - 20x + 75$ completely.

A $(x-5)(x+15)$
B $(x+5)(x+15)$
C $(x+5)(x-15)$
D $(x-5)(x-15)$

____ **87.** Factor $-4x^2 + 68x - 120$ completely.

A $-4(x-2)(x-15)$
B $-4(x+2)(x+15)$
C $-4(x+2)(x-15)$
D $-4(x-2)(x+15)$

____ **88.** Solve $-8x^2 + 120x + 432 = 0$.

A $x = 18$ and $x = -3$
B $x = -18$ and $x = 3$
C $x = \frac{9}{4}$ and $x = -\frac{3}{8}$
D $x = -144$ and $x = 24$

____ **89.** Determine the roots of the quadratic equation $-5x^2 + 55x = 50$.

A $x = -10$ and $x = -1$
B $x = -50$ and $x = -5$
C $x = 10$ and $x = 1$
D $x = 2$ and $x = \frac{1}{5}$

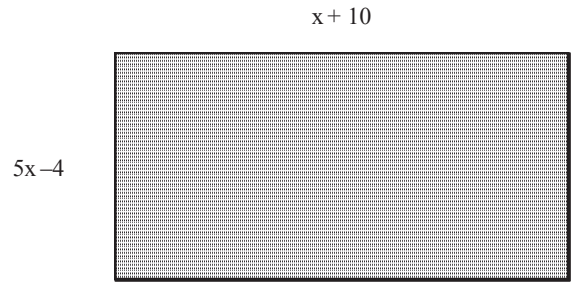
____ **90.** Determine the roots of the quadratic equation $144x^2 - 324 = 0$.

A $x = \frac{4}{9}$ and $x = -\frac{4}{9}$
B $x = \frac{3}{2}$ and $x = -\frac{3}{2}$
C $x = \frac{9}{4}$ and $x = -\frac{9}{4}$
D $x = \frac{2}{3}$ and $x = -\frac{2}{3}$

____ **91.** Solve $(x+4)(x-9) = 0$.

A $x = 4$ and $x = -9$
B $x = 4$ and $x = 9$
C $x = -4$ and $x = 9$
D $x = -4$ and $x = -9$

____ **92.** A rectangle has dimensions $x + 10$ and $5x - 4$, where x is in centimetres. If the area of the rectangle is 72 cm^2, what is the value of x, to the nearest tenth of a centimetre?



A $x = 2.0$
B $x = -4.6$
C $x = 11.2$
D $x = -11.2$

____ **93.** The value of k that makes the expression $x^2 + 72x + k$ a perfect square trinomial is

A 1296
B 144
C 0
D 72

____ **94.** The vertex form of $4x^2 + 16x + 11 = 0$ is

A $4(x+5)^2 - 2 = 0$
B $4(x-2)^2 + 5 = 0$
C $4(x+2)^2 - 5 = 0$
D $4(x-2)^2 - 5 = 0$

____ **95.** Which is the vertex form of $2x^2 - 12x - 10 = 0$? Round coefficients to the nearest hundredth if necessary.

A $2(x+3)^2 - 28 = 0$
B $2(x-28)^2 - 3 = 0$
C $2(x+3)^2 + 28 = 0$
D $2(x-3)^2 - 28 = 0$

____ **96.** Solve $(x+1)^2 = 43$.

A $1 + \sqrt{43}$ and $1 - \sqrt{43}$
B $-1 + \sqrt{43}$ and $-1 - \sqrt{43}$
C $2\sqrt{11}$
D $\sqrt{42}$

____ **97.** The roots, to the nearest hundredth, of $y = -\frac{1}{2}x^2 - 2x + \frac{7}{10}$ are

A –8.65 and 0.65
B 4.32 and –0.32
C –2.16 and 0.16
D –4.32 and 0.32

____ **98.** The roots, to the nearest hundredth, of $y = 7.2x^2 - 33.1x + 18.3$ are

A 7.91 and 1.29
B 1.98 and 0.32
C 3.95 and 0.64
D –3.95 and –0.64

____ **99.** A rectangle with an area of $2504\ \text{cm}^2$ is x centimetres wide and $(x + 8)$ centimetres long. To the nearest tenth of a centimetre, the width and length are

A 50.0 cm and 50.0 cm
B –46.2 cm and –54.2 cm
C 46.2 cm and 54.2 cm
D –14.0 cm and 114.0 cm

____ **100.** When Alex rides his dirt bike off a ramp, his path can be modelled by $h(d) = -3.9d^2 + 13.1d + 8.7$, where d is the horizontal distance from the ramp and h is the height, both in metres. How far away from the ramp does he land, to the nearest tenth of a metre?

A 2.0 m
B 0.6 m
C 7.9 m
D 3.9 m

____ **101.** The x-intercepts, to the nearest hundredth, of $y = -33.8x^2 + 6.8x + 13.4$ are

A –0.27 and 0.37
B –0.54 and 0.74
C –1.07 and 1.48
D –0.64 and 0.64

____ **102.** The number of real roots for the equation $y = -30.6x^2 + 30.7x - 39.8$ is

A 2
B 0
C 1
D impossible to tell

____ **103.** For a science experiment, a projectile is launched. Its path is given by $h(d) = -4.0d^2 + 61.3d + 20.9$, where h is the height of the projectile above the ground and d is the horizontal distance of the projectile from the launch pad, both in metres. How far away from the launch pad is the projectile when it begins to fall, to the nearest tenth of a metre?

A 255.8 m
B 7.7 m
C 0.3 m
D 15.7 m

____ **104.** The table shows the coordinates of the curve of a parabolic arch at the entrance to a park, where x is the horizontal distance from one side of the arch and h is the height of the arch above ground, both in metres.

x	*h*
0.25	7.75
0.50	9.00
0.75	9.75
1.00	10.00
1.25	9.75
1.50	9.00
1.75	7.75

The quadratic equation that models the data is

A $y = 4x^2 + 8x + 6$
B $y = 4x^2 - 8x + 6$
C $y = -4x^2 - 8x - 6$
D $y = -4x^2 + 8x + 6$

Chapter 5 Radicals

____ **105.** Find a simplified expression for the perimeter of this shape.

Not to scale.

A $44\sqrt{5}-8\sqrt{6}-32$
B $22\sqrt{5}-4\sqrt{6}-16$
C $12\sqrt{2}+4\sqrt{3}+4$
D $4\sqrt{6}+\sqrt{3}-8-\sqrt{2}$

____ **106.** What does the expression $7\sqrt{7}-6\sqrt{12}-(4\sqrt{28}+4\sqrt{3})$ simplify to?

A $15\sqrt{7}-16\sqrt{3}$
B $15\sqrt{7}+16\sqrt{3}$
C $-\sqrt{7}-16\sqrt{3}$
D $-\sqrt{7}+16\sqrt{3}$

____ **107.** State the side length of a square with an area of 1573 cm^2 in simplified radical form.

A $11\sqrt{13}$ cm
B $\frac{1573}{\sqrt{2}}$ cm
C $\sqrt{786.5}$ cm
D $\frac{1573}{2}$ cm

____ **108.** Express $\sqrt[5]{64n^{10}m^{15}}$ in simplified form.

A $4n^2m^3(\sqrt[5]{4})$
B $2n^3m^2(\sqrt[2]{5})$
C $4n^2m^3(\sqrt[5]{2})$
D $2n^2m^3(\sqrt[5]{2})$

____ **109.** Determine the value of the expression $\sqrt{x^2+y^3}$ when $x=7$ and $y=4$.

A 56
B $\sqrt{11}$
C $\sqrt{26}$
D $\sqrt{113}$

____ **110.** Simplify $3\sqrt{175}+6\sqrt{63}$.

A $9+\sqrt{238}$
B $33\sqrt{7}$
C $9+2\sqrt{2}$
D 114

____ **111.** Simplify $6\sqrt{80}-2\sqrt{20}$.

A $4+\sqrt{2}$
B $4+2\sqrt{15}$
C –36
D $20\sqrt{5}$

____ **112.** Simplify the expression $\frac{5}{6}(\sqrt[3]{1080})+\frac{\sqrt[3]{135}}{8}$

A $\frac{43}{8}(\sqrt[3]{5})$
B $\frac{23}{24}(\sqrt[3]{6})$
C $\frac{5}{48}(\sqrt[3]{5})$
D $\frac{5}{48}+270\sqrt{2}$

____ **113.** The volume, *V*, in cubic units, of a cylinder is given by $V = \pi r^2 h$, where *r* is the radius and *h* is the height, both in the same units. Find the exact radius of a cylinder with a height of 64 cm and a volume of 576π cm^3. Express your answer in simplest form.

A $\frac{1}{\sqrt{64}}$ cm

B 8 cm

C 9 cm

D 3 cm

____ **114.** Express $-7\sqrt{6}(-6\sqrt{5} - 2\sqrt{6})$ in simplest form.

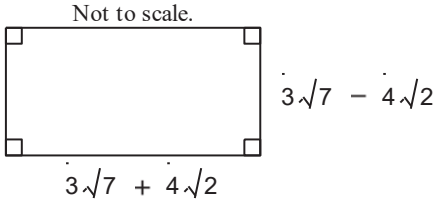
A $14\sqrt{6} + 42\sqrt{30}$

B 252

C $42\sqrt{30} + 84$

D $1260 + 14\sqrt{6}$

____ **115.** Find a simplified expression for the area of this shape.



A $9\sqrt{7} + 16\sqrt{2}$

B $9\sqrt{7} - 16\sqrt{2}$

C 95

D 31

____ **116.** Express $(\sqrt{19} - \sqrt{7})(\sqrt{19} + \sqrt{7})$ in simplest form.

A $2\sqrt{19} - 19\sqrt{7}$

B $2\sqrt{3}$

C 12

D $2\sqrt{19} - 2\sqrt{7}$

____ **117.** Express $\frac{2\sqrt{21} - 3\sqrt{7}}{\sqrt{7}} + \frac{4\sqrt{3} - 8}{\sqrt{4}}$ in simplest form.

A $6\sqrt{3} - 5$

B $6\sqrt{21} - 14\sqrt{7}$

C $4\sqrt{3} - 7$

D $2\sqrt{21} - 3\sqrt{7} + 4\sqrt{3} - 2$

____ **118.** **OMIT**

____ **119.** **OMIT**

____ **120.** A radical expression is being simplified. In which step of the process was an error made?

A Step A
B Step D
C Step C
D Step B

$$\frac{\sqrt{b} + 6\sqrt{s}}{\sqrt{b}} = \frac{\sqrt{b} + 6\sqrt{s}}{\sqrt{b}}\left(\frac{\sqrt{b}}{\sqrt{b}}\right)$$

$$= \frac{\sqrt{b}(\sqrt{b} + 6\sqrt{s})}{(\sqrt{b})(\sqrt{b})} \quad \text{Step A}$$

$$= \frac{\sqrt{b}(\sqrt{b}) + \sqrt{b}(6\sqrt{s})}{2b} \quad \text{Step B}$$

$$= \frac{b + 6\sqrt{bs}}{2b} \quad \text{Step C}$$

$$= \frac{1}{2} + 3\frac{\sqrt{bs}}{b} \quad \text{Step D}$$

____ **121.** Determine the range of the function $y = \sqrt{x-2}$.

A $\{y \in R\}$
B $\{y \in R, y \geq 0\}$
C $\{x \in R\}$
D $\{x \in R, x \geq -2\}$

____ **122.** Determine the value of the function $f(x) = -\sqrt{7-x}$ when $x = -2$.

A 3
B –9
C –3
D 9

____ **123.** Solve $\sqrt{7x} = 5$.

A $x = \frac{25}{49}$
B $x = \frac{25}{7}$
C $x = \frac{5}{7}$
D $x = \frac{5}{49}$

____ **124.** Solve $\sqrt{4x} - 5 = 6$

A $x = \frac{121}{16}$
B $x = \frac{11}{16}$
C $x = \frac{121}{4}$
D $x = \frac{11}{4}$

____ **125.** Solve $\sqrt{6x} + 7 = \sqrt{7x+7} + 6$.

A $x = -6$
B $x = 24$
C $x = 6$
D $x = 12$

____ **126.** Solve $\sqrt{x+3} = \sqrt{2x+8}$.

A $x = 25$
B $x = -5$
C $x = \frac{1}{25}$
D $x = -\frac{1}{5}$

____ **127.** Solve $2\sqrt{\frac{x}{-9}} = \sqrt{68}$.

A $x = -\frac{1}{153}$
B $x = -\frac{9}{136}$
C $x = -153$
D $x = -15\frac{1}{9}$

____ **128.** Solve $x - 15\sqrt{x} + 56 = 0$.

A $x = \frac{225}{3136}$
B $x = 13\frac{211}{225}$
C $x = -49$ or $x = -64$
D $x = 64$ or $x = 49$

____ **129.** What are the restrictions on x if the solution to the equation $-4 - \sqrt{4-x} = 6$ involves real numbers?

A $x \leq 10$
B $x \geq 6$
C $x \leq 4$
D $x \geq 100$

Chapter 6 Rational Expressions

____ **130.** Marco tested three values of x in two rational expressions and found that one value of x returned different values for y in the two given expressions. Which of the following conclusions is correct?

A The two rational expressions are not equivalent.
B The two rational expressions are equivalent part of the time.
C More testing is needed to draw a conclusion.
D The two rational expressions are equivalent.

____ **131.** The non-permissible value(s) for the rational expressions $\frac{12}{x^2-4}$ is (are)

A $x \neq 2, x \neq -2$
B $x \neq 2\sqrt{3}$
C $x \neq 2$
D $x \neq 4$

____ **132.** The non-permissible value(s) for the expression $\frac{-9x+8}{-9x^2-55x+56}$ is (are)

A $x \neq -\frac{8}{9}$
B $x \neq 8$
C $x \neq \frac{8}{9}$ and $x \neq -7$
D there are no restrictions

____ **133.** What is $\frac{5(4x^2-y^2)}{2x^2-15xy-8y^2}$ in simplest form? State any non-permissible values.

A $\frac{5(2x+y)}{x-8y},\ x \neq -\frac{y}{2},\ x \neq +8y$
B $\frac{5(2x+y)}{x+8y},\ x \neq -\frac{y}{2},\ x \neq -8y$
C $\frac{5(2x-y)}{x+8y},\ x \neq \frac{y}{2},\ x \neq -8y$
D $\frac{5(2x-y)}{x-8y},\ x \neq -\frac{y}{2},\ x \neq 8y$

____ **134.** Simplify $\frac{24x^2+101x+105}{9x^2+42x+49}$.

A $\frac{8x+15}{-3x-7}$
B $\frac{8x+15}{3x+7}$
C $\frac{-8x-15}{-3x-7}$
D $\frac{8x-15}{-3x+7}$

____ **135.** What is the simplified version of the rational expression $\frac{-3x+12}{32-8x}$?

A $\frac{3}{8}(x-4)$
B $x-4$
C $\frac{3}{8}$
D $-\frac{3}{8}$

____ **136.** When fully simplified, ignoring non-permissible values, $\frac{6x^9}{3x^3} \times \frac{x^8}{9x^6}$ is equal to

A $\frac{2}{9}x^8$
B $\frac{9}{2}x^4$
C $\frac{2}{9}x^4$
D $\frac{9}{2}x^8$

____ **137.** When fully simplified, ignoring non-permissible values, $\frac{12x^{12}}{4x^3} \div \frac{x^8}{24x^6}$ is equal to

A $72x^3$

B $\frac{1}{72}x^7$

C $\frac{1}{72}x^3$

D $72x^7$

____ **138.** Simplify the rational expression $\frac{6a^4b^7}{(3ab)^2} \times \frac{(a^4b^7)^2}{(3ab^4)^3}$.

A $\frac{2}{243}a^5b^7$

B $\frac{2}{243}a^7b^7$

C $\frac{2}{81}a^5b^7$

D $\frac{2}{81}a^7b^7$

____ **139.** Simplify the rational expression $\frac{4x^8y^5}{(2xy)^3} \div \frac{(x^8y^5)^3}{(2xy^8)^4}$. Express your answer with positive exponents only.

A $8x^{33}y^3$

B $8\frac{y^{19}}{x^{15}}$

C $\frac{1}{32}\frac{y^{19}}{x^{33}}$

D $\frac{1}{32}\frac{x^{33}}{y^3}$

____ **140.** Express the product $\frac{x^2+6x}{2x^2+15x+27} \times \frac{x+3}{x^2-36}$ in simplest form.

A $\frac{(x^2+6x)(x+3)}{(2x^2+15x+27)(x^2-36)}$

B $\frac{x}{(2x+9)(x-6)}$

C $\frac{x}{(2x-36)(x+6)}$

D $-\frac{1}{2x+9}$

____ **141.** Express the quotient $\frac{x^2-5x-24}{x^2-11x+24} \div \frac{2x^2+7x+3}{x^2+x-12}$ in simplest form.

A $\frac{2x+1}{x+4}$

B $\frac{x+4}{2x+1}$

C $\frac{(x+3)(2x+1)}{(x-3)(x+4)}$

D $\frac{(x-3)(x+4)}{(x+3)(2x+1)}$

____ **142.** When fully simplified, $\frac{22x}{5} + \frac{4x}{5}$ is equal to

A $26x$

B $\frac{88}{25}x$

C $\frac{26}{5}x$

D $\frac{11}{2}x$

____ **143.** When fully simplified, $\frac{13}{x+5} - \frac{12}{x+5}$ is equal to

A $\frac{13}{12}(x+5)$

B $\frac{25}{x+5}$

C $\frac{1}{5}(x+5)$

D $\frac{1}{x+5}$

____ **144.** When fully simplified, ignoring restrictions on the variable, $\frac{6xy-8}{x^2y^2} + \frac{-3-7xy}{7xy}$ is equal to

A $\frac{3xy-15}{7x^2y^2}$

B $\frac{-7x^2y^2+39xy-56}{7x^2y^2}$

C $\frac{-7x^2y^2+39xy-56}{7x^3y^3}$

D $\frac{-xy-11}{7x^3y^3}$

____ **145.** Simplify the rational expression $\frac{5x+3}{x^2} - \frac{8x^2+9}{x^3}$.

A $\frac{-8x^2+5x-6}{x^3}$

B $\frac{-8x^2+5x-6}{x^2}$

C $\frac{-3x^2+3x-9}{x^3}$

D $\frac{-3x^2+3x-9}{x^2}$

____ **146.** When fully simplified, ignoring restrictions on the variable, $\frac{x+8}{x^2+9x+20} + \frac{x+5}{x^2+7x+12}$ is equal to

A $\frac{2x+13}{2x^2+16x+32}$

B $\frac{(x+8)(x+5)}{(x^2+9x+20)(x^2+7x+12)}$

C $\frac{2x^2-21x-49}{(x+5)(x+4)(x+3)}$

D $\frac{2x^2+21x+49}{(x+5)(x+4)(x+3)}$

____ **147.** Simplify $\frac{\frac{-2}{x-7} + \frac{4}{x+7}}{\frac{x}{x^2-49} - \frac{-2}{x-7}}$. State any non-permissible values.

A $\frac{2}{x-7}$, $x \neq \pm 2$

B $\frac{2}{x+2}$, $x \neq \pm 7$

C $\frac{2(x-21)}{(3x+14)}$, $x \neq \pm 7$

D $\frac{2(-x+21)}{(3x+14)}$, $x \neq \pm 2$

____ **148.** In a biathlon race, Murray must cycle 60 km and then run 20 km. Using v_c as his cycling speed and v_r as his running speed, what is the correct simplified expression for the total time needed to complete the race?

A $\frac{60v_c + 20v_r}{v_r + v_c}$

B $\frac{60v_r + 20v_c}{v_r + v_c}$

C $\frac{60v_r + 20v_c}{v_r v_c}$

D $\frac{60v_c + 20v_r}{v_r v_c}$

____ **149.** Courtney and Kurtis are planning to travel 60 km in a car by travelling at x kilometres per hour for the first half of the distance, and then increasing their speed by 5 km/h to finish the distance. Which is the correct simplified expression for the total time of the trip?

A $\frac{30x+150}{x(x+5)}$

B $\frac{60x+150}{2x+5}$

C $\frac{30x+150}{2x+5}$

D $\frac{60x+150}{x(x+5)}$

____ **150.** Solve the rational equation $\frac{x}{6}-\frac{5}{x}=0$. Identify all non-permissible values.

A $x=\pm 6\sqrt{5},\ x\neq 6$

B $x=30,\ x\neq 6$

C $x=\pm\sqrt{30},\ x\neq 0$

D $x=\frac{5}{6},\ x\neq 0$

____ **151.** Solve the rational equation $\frac{x}{x+1}=\frac{4-x}{x^2-3x-4}+\frac{6}{x-4}$.

A $x=10$

B $x=4$ and -1

C $x=-10$

D $x=-10$ and 1

____ **152.** Evan starts out on a snowmobile trail and travels at 35 km/h. Bonnie leaves 10 min later, travelling at v kilometres per hour, and overtakes Evan after t hours. How fast would Bonnie have to travel to overtake Evan in 30 min? Express your answer to the nearest tenth.

A 35.2 km/h

B 46.7 km/h

C 38.0 km/h

D 105.0 km/h

____ **153.** What is the exact solution to the equation $\frac{9x+2}{x-9}=\frac{2}{5}$

A $-\frac{28}{43}$

B $-\frac{2}{9}$

C $\frac{9}{5}$

D $-\frac{43}{28}$

____ **154.** Solve $\frac{x^2+25x+136}{-3-x}=\frac{x^2-2x-80}{x-2}$.

A $x=-3$ and $x=-2$ and $x=8$

B $x=-4$ and $x=8$

C $x=4$ and $x=-8$ and $x=-8$

D $x=24$

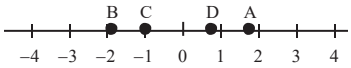
____ **157.** Determine the value of the absolute value expression $5\left|(-8-(-9))\right|$.

A –5
B 85
C –85
D 5

____ **158.** Determine the value of the absolute value expression $\dfrac{-7-\left|-7^3-(-6)\right|}{-2}$.

A $-\dot{2}443\dot{2}$
B $\dot{2}443\dot{2}$
C 172
D –172

____ **159.** Identify where on the number line $|-1.8|$ is located.



A C
B B
C D
D A

____ **160.** Evaluate $\left|-5+6^2\right|-\left|8-(-9)\right|+|2-5|+|-4|$.

A 17
B 21
C 35
D 25

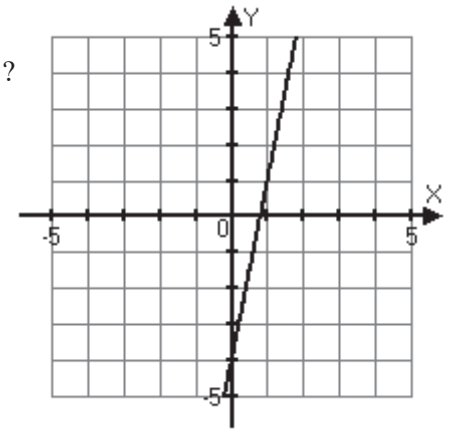
____ **161.** Determine the range of $y=|-2x+2|$

A $y\varepsilon\Re$
B $y<0$
C $y>0$
D $y\geq 0$

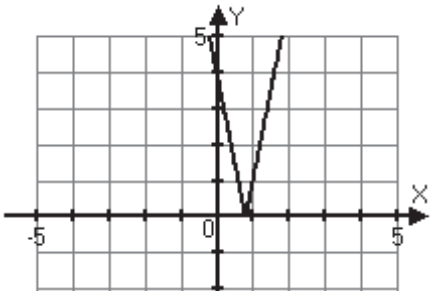
____ **162.** What are the domain and range of $y=|-3x+2|$?

A Domain: $\{x|x\in R\}$
Range: $\{y|y\in R\}$
B Domain: $\{x|x\in R\}$
Range: $\{y|y\geq 0, y\in R\}$
C Domain: $\{y|y\in R\}$
Range: $\{x|x\geq 0, x\in R\}$
D Domain: $\{x|x\leq 0, x\in R\}$
Range: $\{y|y\in R\}$

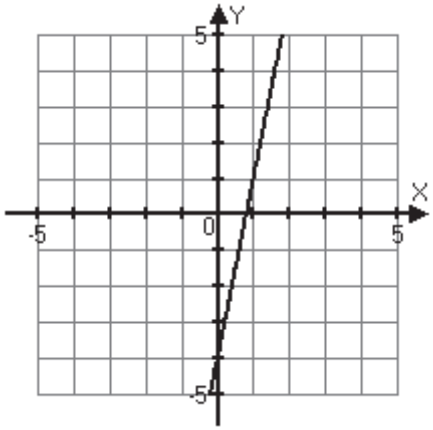
____ **163.** Given the graph of $y = f(x)$ on right, which is the graph of $y = |f(x)|$?



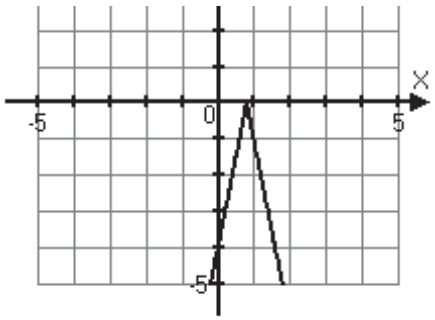
A



B



C



____ **164.** What are the domain and range of $y = |6x^2 + 3x - 3|$?

A Domain: $\{x | x \in R\}$

Range: $\{y | y \in R\}$

B Domain: $\{y | y \in R\}$

Range: $\{x | x \geq 0, x \in R\}$

C Domain: $\{x | x \leq 0, x \in R\}$

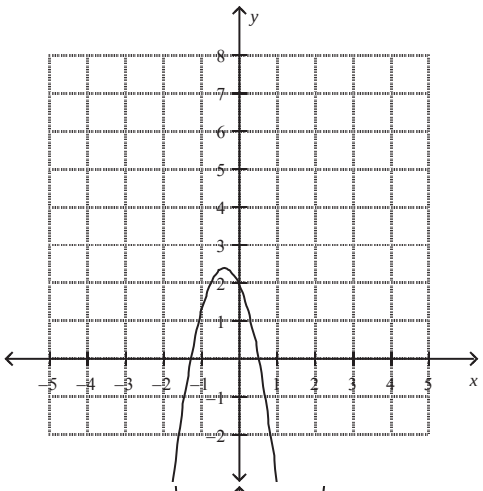
Range: $\{y | y \in R\}$

D Domain: $\{x | x \in R\}$

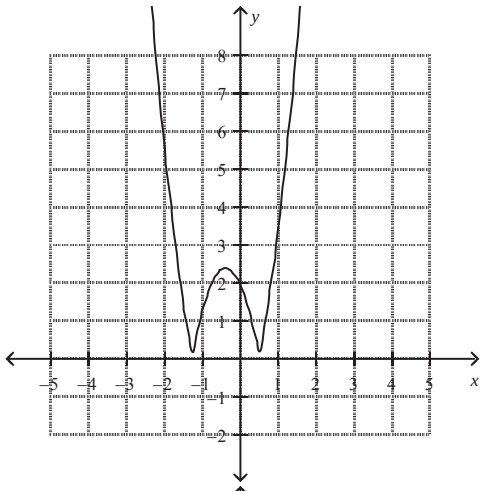
Range: $\{y | y \geq 0, y \in R\}$

____ **165.** The graph of $y = \left|-3x^2 + 2x + 2\right|$ is

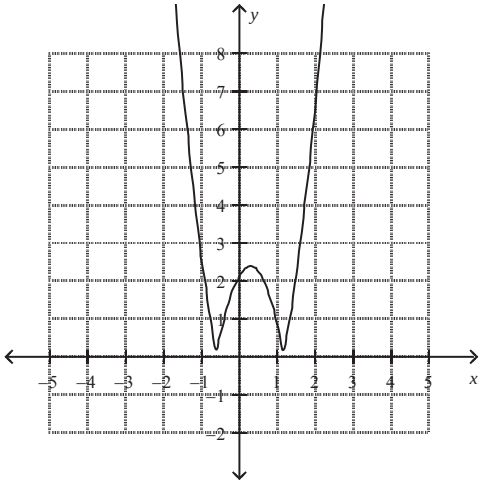
A



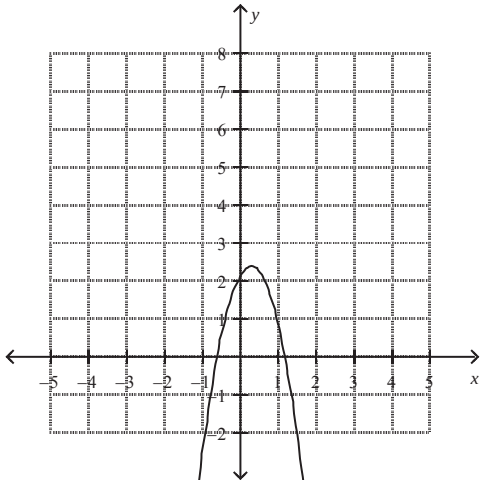
C



B

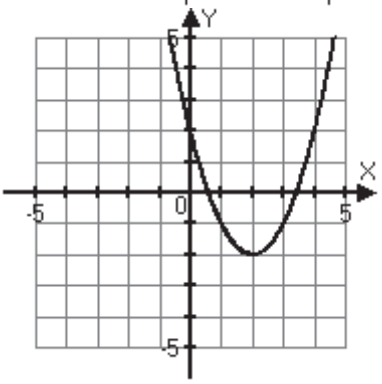


D

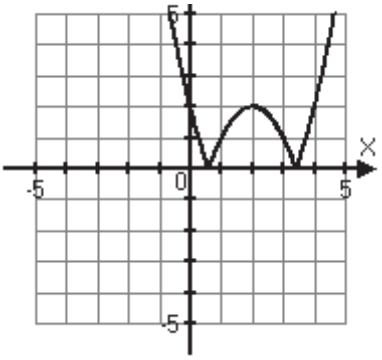


____ **166.** The graph of $y = \left|(x+2)^2 - 2\right|$ is

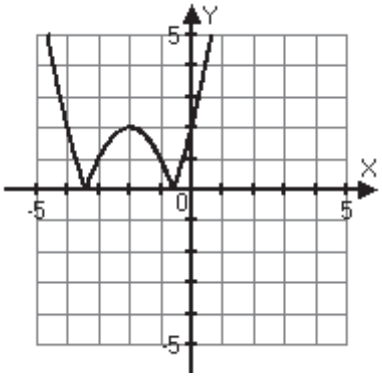
A



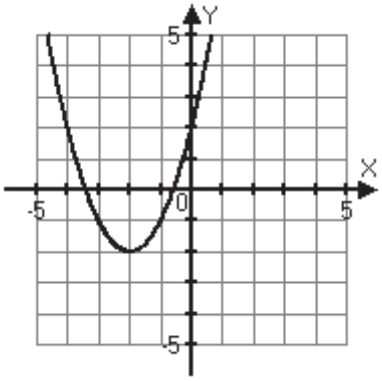
B



C

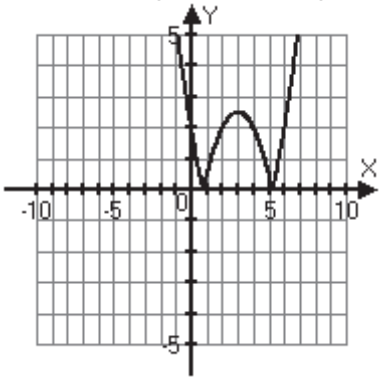


D

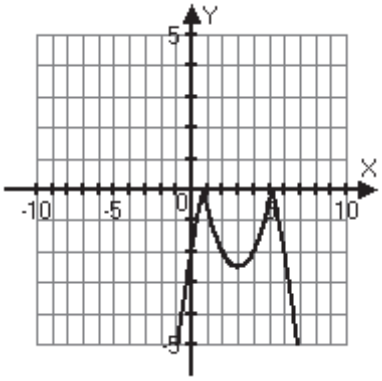


____ **167.** The graph of $y = \left|\frac{1}{2}x^2 - 3x + 2\right|$ is

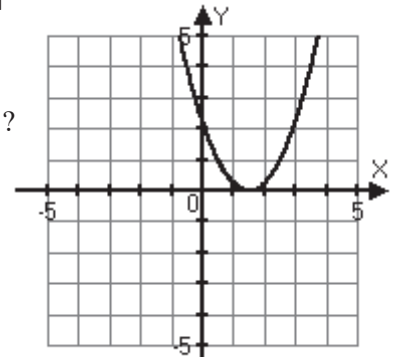
A



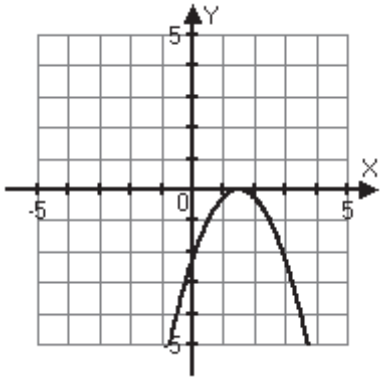
B



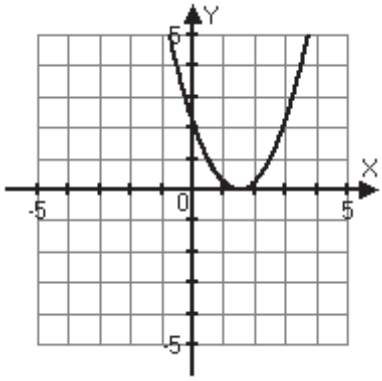
____ **168.** Given the graph of $y = f(x)$, which is the graph of $y = |f(x)|$?



A



B



____ **169.** Solve $|x + 4| = 7$.

A $x = 3$
B $x = 3$ or $x = -11$
C $x = 11$
D $x = -3$ or $x = 11$

____ **170.** Determine the solution to $|6x + 9| + 2 = 8$.

A $x = -\frac{1}{2}$ or $x = -\frac{5}{2}$
B no solution
C $x = \frac{1}{2}$ or $x = \frac{5}{2}$
D $x = \frac{5}{2}$

____ **171.** Determine the solution to $|2x + 8| + 6 = -3$

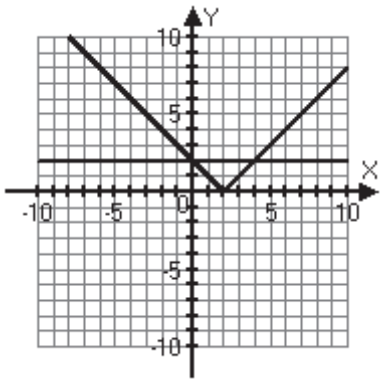
A $x = -\frac{17}{2}$ or $x = \frac{1}{2}$
B $x = \frac{17}{2}$ or $x = -\frac{1}{2}$
C no solution
D $x = -\frac{1}{2}$

____ **172.** What is the solution to $|4x + 8| = -8x + 3$?

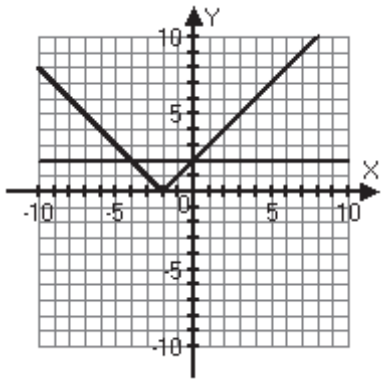
A $x = -\frac{5}{12}$ or $x = \frac{11}{4}$
B $x = \frac{5}{12}$ or $x = \frac{11}{4}$
C $x = \frac{5}{12}$
D $x = -\frac{5}{12}$

____ **173.** Which graph represents the solution to $|x-2| = 2$?

A



B



____ **174.** Solve $\left|x^2 - 7\right| = 3$.

A $x = \sqrt{10}$
B $x = \pm 2$
C $x = \pm\sqrt{10}, x = \pm 2$
D $x = \sqrt{10}, x = 2$

____ **175.** Solve $\left|x^2 + 3x + 3\right| = 3x + 7$.

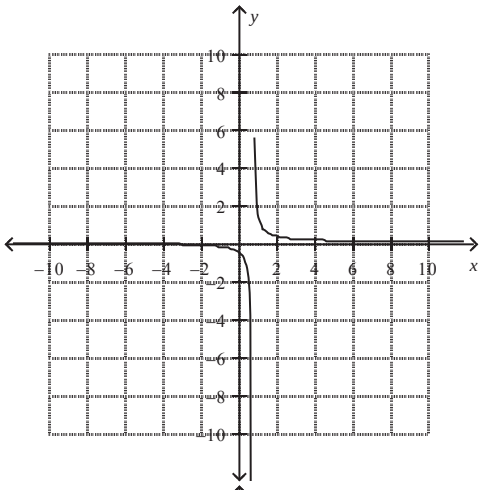
A $x = -2$ and -2
B $x = -2$ and -4
C $x = 2$ and -2
D $x = 2$ and -2

____ **176.** The equation of the vertical asymptote for the reciprocal of $y = 8x - 4$ is

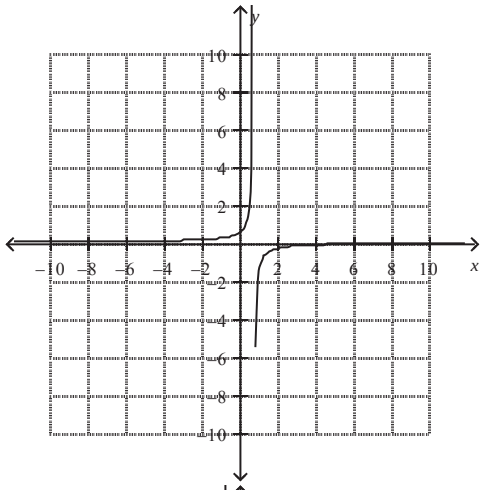
A $x = -\frac{1}{2}$
B $x = 2$
C $x = \frac{1}{2}$
D $x = -2$

____ **177.** Which graph represents the reciprocal of $y = \frac{5}{2}x + 2$?

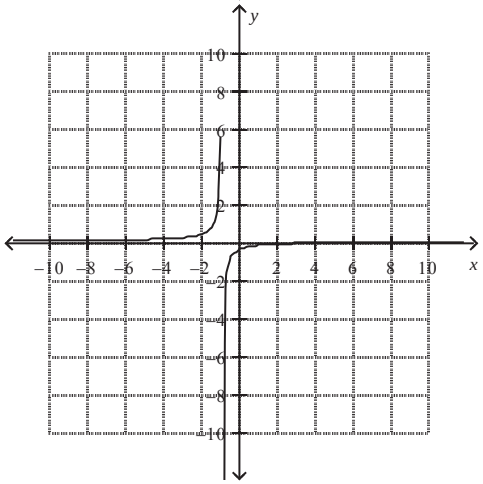
A



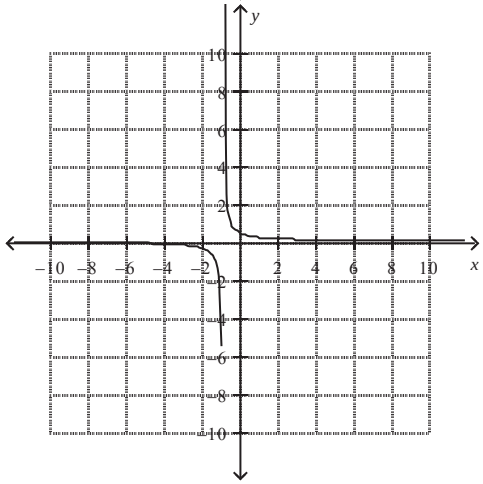
C



B

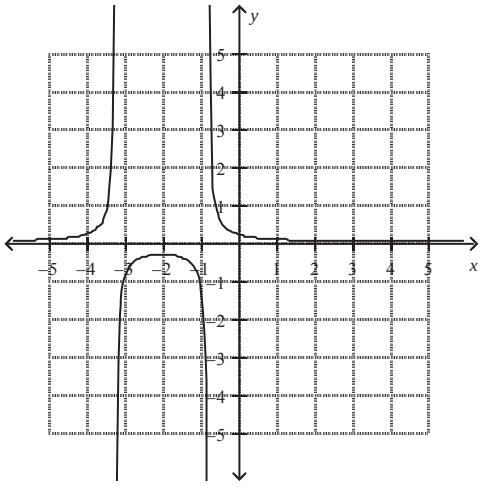


D

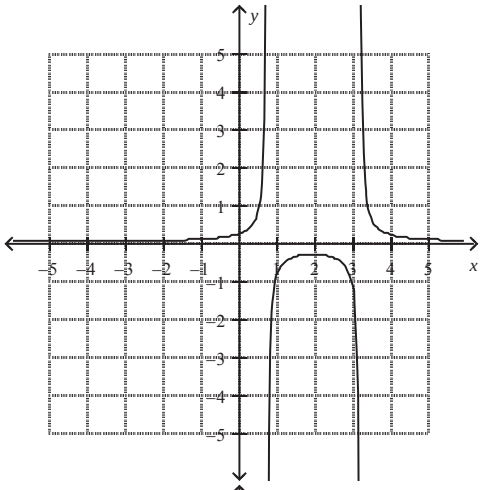


____ **178.** Which graph represents the reciprocal of $y = 2\ x + 2\ ^{2} - 3$?

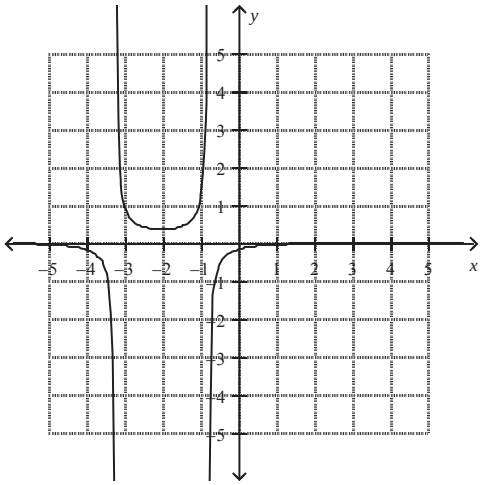
A



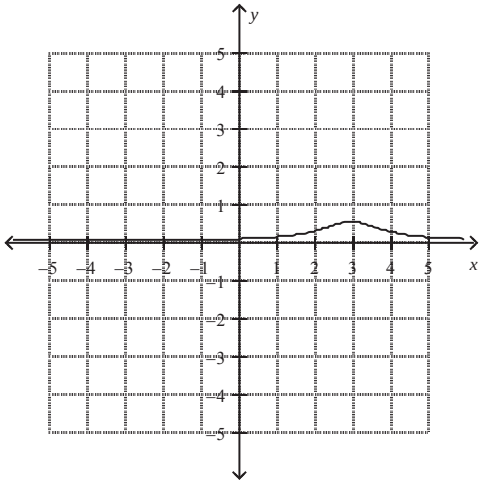
C



B



D



____ **180.** Omit

____ **181.** Omit

Chapter 8 Systems

____ 182. Determine the approximate solutions to the system of equations:

$$y = \frac{2}{5}x + 1.8$$
$$y = 0.2\ (x - 1.9)^2 - 3.1$$

A $2.51, 0.79$ and $8.31, 5.13$

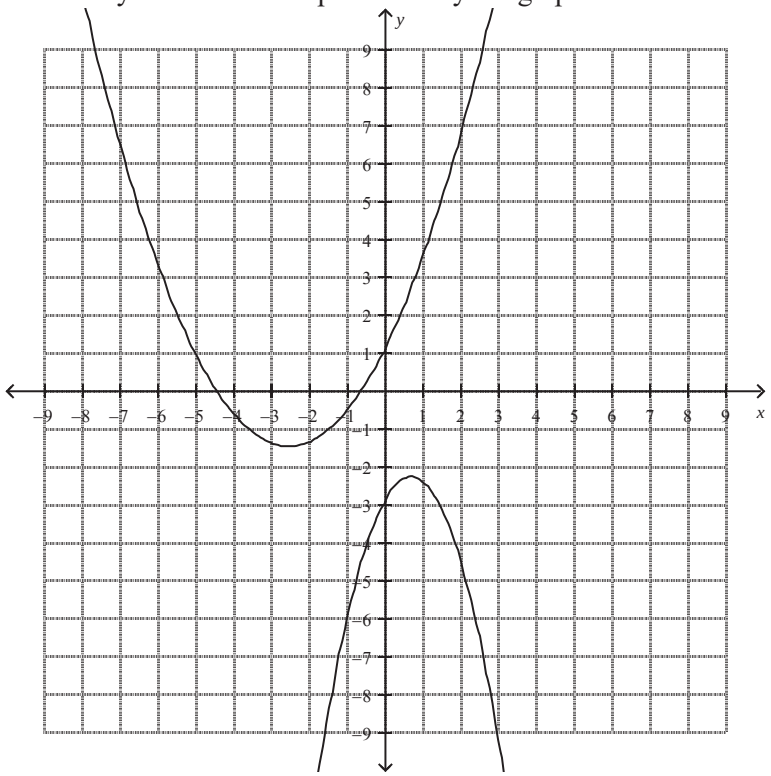
B $2.51, 0.79$ and $-8.31, -5.13$

C $-2.51, -0.79$ and $-8.31, -5.13$

D $-2.51, 0.79$ and $8.31, 5.13$

____183.- 186 Omit

____187. How many solutions are represented by the graph shown below?



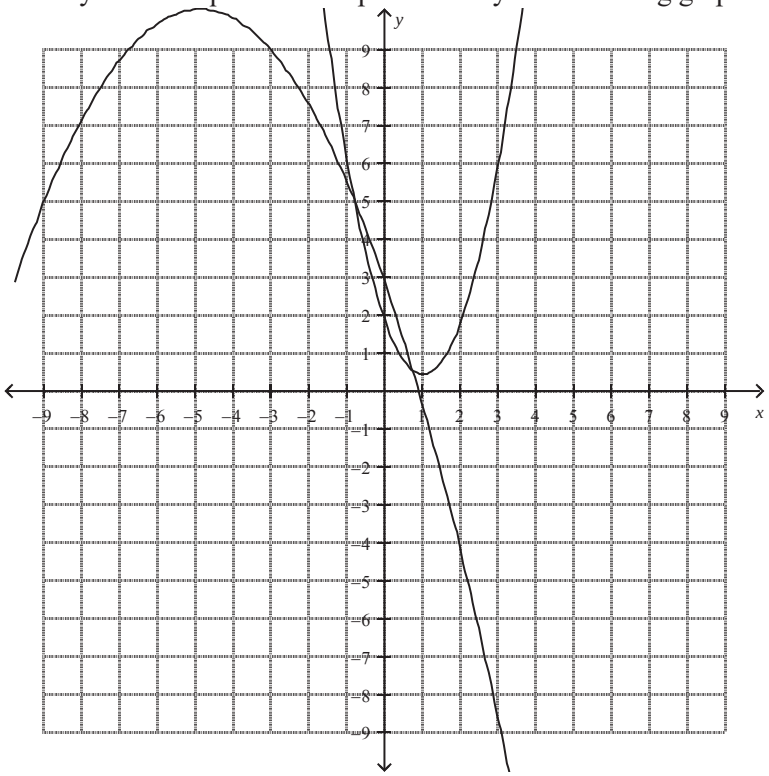
A two solutions

B one solution

C three solutions

D no real solution

____ **188.** What system of equations is represented by the following graph?



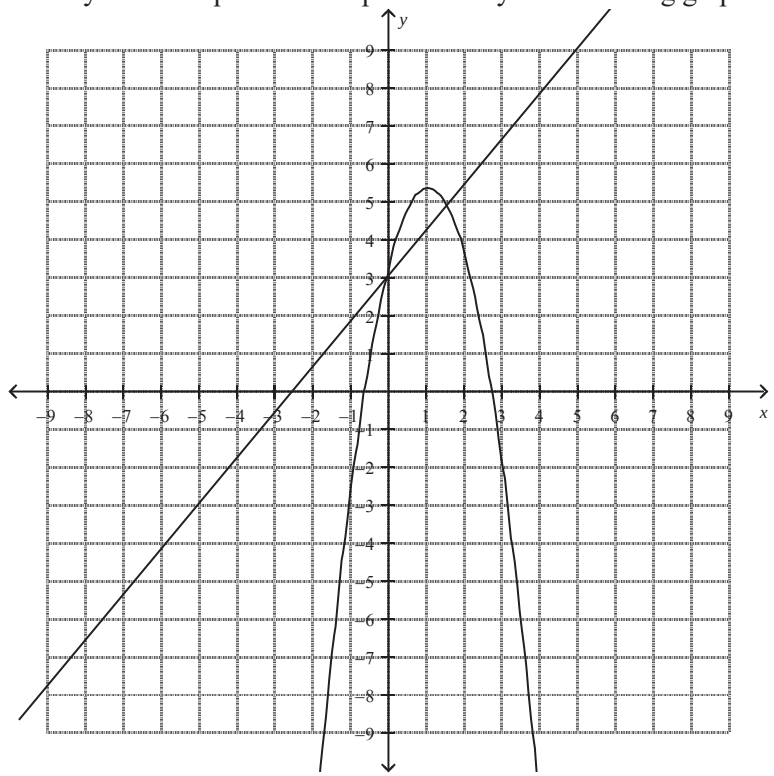
A $y = -1.4x^2 + 3x + 2$
$y = 0.3x^2 + 2.9x + 3$

B $y = -1.4x^2 - 3x + 2$
$y = 0.3x^2 - 2.9x + 3$

C $y = 1.4x^2 - 3x + 2$
$y = -0.3x^2 - 2.9x + 3$

D $y = -0.3x^2 - 3x + 2$
$y = 1.4x^2 - 2.9x + 3$

____ **189.** What system of equations is represented by the following graph?



A $y = 1.2x + 3$

$y = -1.9x^2 + 4.2x + 3$

B $y = -1.9x - 3$

$y = 1.2x^2 + 4.2x + 3$

C $y = -1.2x + 3$

$y = 1.9x^2 + 4.2x + 3$

D $y = -1.2x + 3$

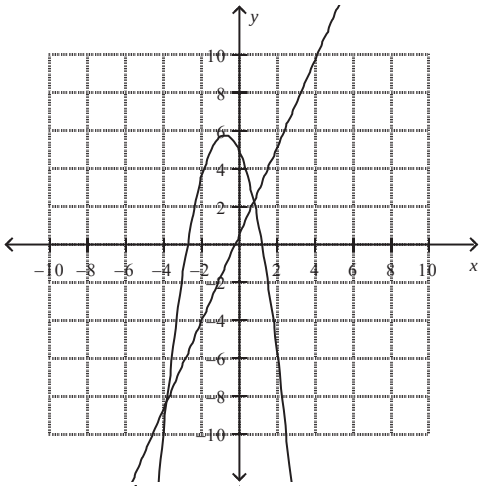
$y = 1.9x^2 - 4.2x + 3$

____ **190.** Which graph represents the system of equations shown below?

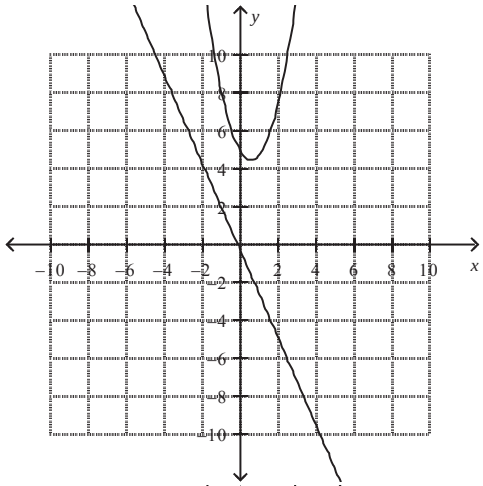
$y = -1.5x^2 - 2x + 5$

$y = 2.3x + 0.2$

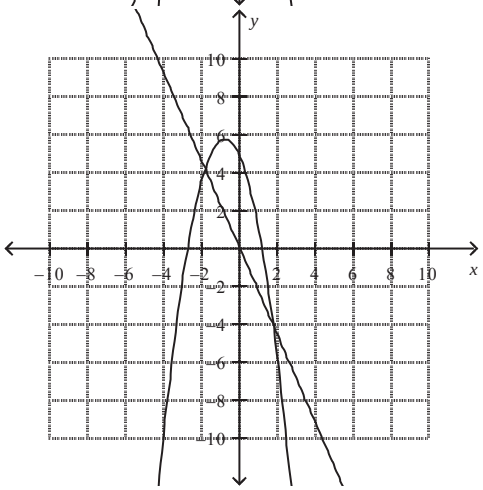
A



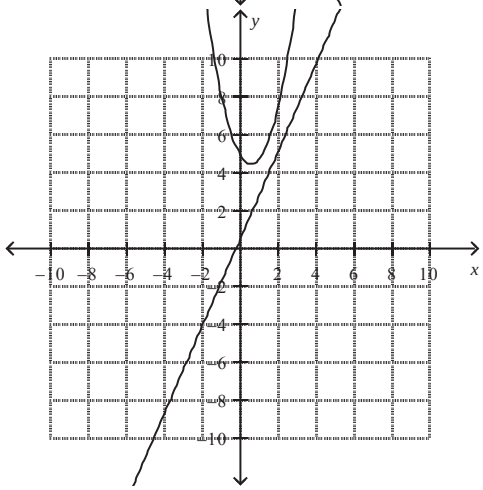
C



B



D



____**191.** Determine the solutions to the system of equations given below.

$y = 0.2x^2 - x + 3$ $y = -1.2x^2 + 5.5x - 2$

A $-0.97, -2.22$ *and* $3.67, 2.02$

B $0.97, 2.22$ *and* $-3.67, -2.02$

C $0.97, 2.22$ *and* $-3.67, -2.02$

D $0.97, 2.22$ *and* $3.67, 2.02$

____ **192.** How many times does a line **tangent to a parabola** cross the parabola?

A twice

B three times

C once

D none of these

____ **193.** The line $y = 9x - 4$ intersects the quadratic function $y = x^2 + 7x - 3$ at one point. What are the coordinates of the point of intersection?

A $(0, 0)$

B $(1, -5)$

C $(-1, 5)$

D $(1, 5)$

____ **194.** Find the coordinates of the point(s) of intersection of the line $y = 4x + 8$ and the quadratic function $y = -4x^2 - 5x + 8$.

A $(0, 8)$ and $(\frac{9}{4}, 17)$

B $(0, 0)$

C $(2, -34)$

D $(-\frac{9}{4}, -1)$ and $(0, 8)$

____ **195.** Solve the following system:

$y = -6x + 9$

$y = -8x^2 - 9x + 9$

A $(-\frac{3}{2}, -\frac{27}{2})$

B $(0, \frac{27}{8})$ and $(\frac{3}{8}, \frac{9}{8})$

C $(-\frac{3}{8}, \frac{45}{4})$ and $(0, 9)$

D $(0, 0)$

____ **196.** The line $y = -2x + b$ is tangent to the curve $y = \frac{1}{3}x^2 - 4x - 3$. Determine the *y*-intercept of a line.

A 3 **B** 6 **C** –6 **D** –3

____ **197.** **OMIT**

____ **198.** The line $y = 16x$ intersects the quadratic function $y = x^2$ at two points. What are the coordinates of the two points of intersection?

A $(0,0)$ and $(16, -256)$

B $(1, 16)$ and $(-16, 256)$

C $(0, 0)$ and $(16, 256)$

D $(2, 2)$ and $(-16, -256)$

____ **199.** Solve the following system of equations:

$y = 4x$

$y = 2x^2$

A $(0,0)$ and $(2, -8)$

B $(2, 4)$ and $(-2, 8)$

C $(2, 2)$ and $(-2, -8)$

D $(0, 0)$ and $(2, 8)$

____ **200.** What are the coordinates of the point(s) of intersection of the line $y = -7x - 5$ and the quadratic function $y = -x^2 - 15x + 4$?

A $(9, 58)$ and $(-1, -12)$

B $(-9, 58)$, and $(1, -12)$

C $(9, -58)$and$(1, 12)$

D $(9, -58)$ and $(1, -12)$

____ **201.** What are the solutions for the following system of equations?

$y = 8x + 7$

$y = -x^2 - 5x + 7$

A $(13, 97)$ and $(0, 7)$

B $(-13, -97)$ and $(0, 7)$

C $(13, -97)$ and $(0, 7)$

D $(13, 97)$ and $(0, -7)$

____ **202.** What are the solutions for the following system of equations?

$y = -2x^2 - 9x - 4$

$y = 2x^2 - 5x - 4$

A $(-1, 3)$ and $(0, -4)$

B $(1, -3)$ and $(0, -4)$

C $(1, 3)$ and $(0, -4)$

D $(1, -3)$ and $(0, 4)$

____ **203.** What are the coordinates of the point(s) of intersection of the quadratic functions $y = -2x^2 - 4x + 5$ and $y = 2x^2 + 4x + 5$?

A $(-2, 5)$ and $(0, 5)$
B $(2, -5)$ and $(0, -5)$
C $(2, 5)$ and $(0, 5)$
D $(2, -5)$ and $(0, 5)$

____ **204.** Solve the system $y = \frac{1}{4}x^2 + 2x - 9$ and $y = -\frac{1}{4}x^2 - 6x + 9$. Express your answers as exact values.

A $(-2, 4)$ and $(18, -36)$
B $(\frac{1}{2}, -\frac{1}{4})$ and $(-\frac{1}{18}, \frac{1}{36})$
C $(2, -4)$ and $(-18, 36)$
D $(-\frac{1}{2}, -\frac{1}{36})$ and $(\frac{1}{18}, -\frac{1}{36})$

Four corners are cut from a rectangular piece of cardboard that measures 5 ft by 3 ft. The cuts are x feet from the corners, as shown in the figure below. After the cuts are made, the sides of the rectangle are folded to form an open box. The area of the bottom of the box is 12 ft^2.

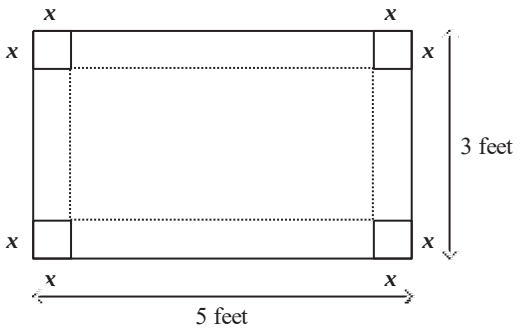


Diagram not drawn to scale

____ **205.** What two equations represent the area, *A*, of the bottom of the box?

A $A = 4x^2 - 16x + 15$
$A = 12$
B $A = 4x^2 + 15$
$A = 12$
C $A = 4x^2 + 15$
$A = 8$
D $A = 4x^2 - 30x + 8$
$A = 8$

____ **206.** What are the approximate dimensions of the box? Give your answer to one decimal place.

A width = 2.6 ft
length = 4.6 ft
height = 3.8 ft
B width = 4.0 ft
length = 2.0 ft
height = 0.5 ft
C width = 4.8 ft
length = 2.8 ft
height = 0.1 ft
D width = 4.6 ft
length = 2.6 ft
height = 0.2 ft

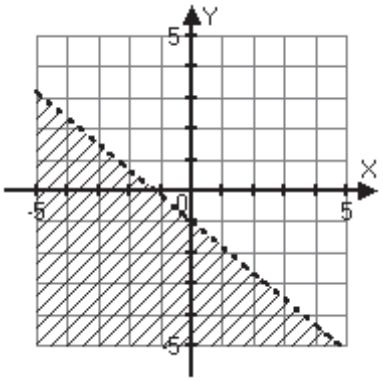
____ **207.** What is the approximate volume of the box? Give your answer to one decimal place.

A 1.4 ft^3
B 4.0 ft^3
C 2.4 ft^3
D 45.6 ft^3

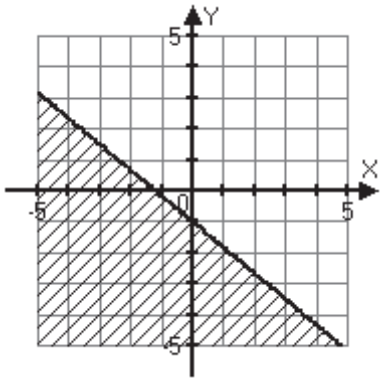
Chapter 9 Inequalities

____ **208.** The graph of $-5x - 6y \leq 6$ is

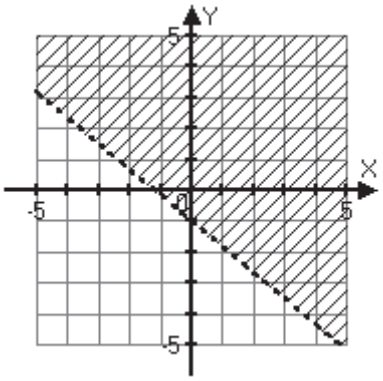
A



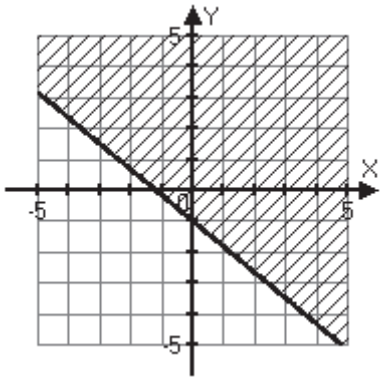
C



B

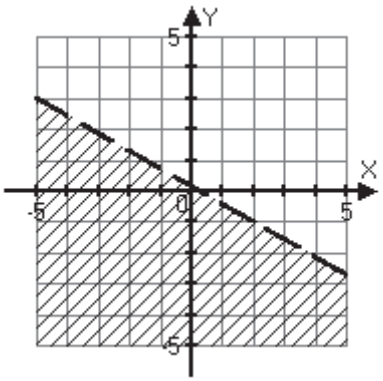


D

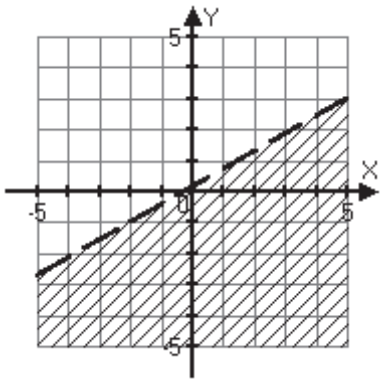


____ **209.** The graph of $-4x + 7y > 1$ is

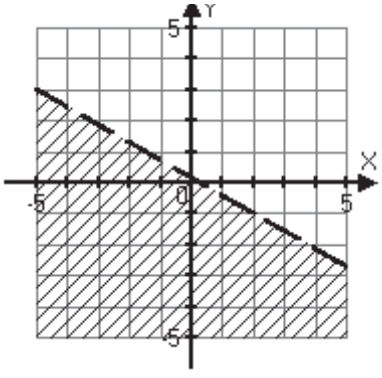
A



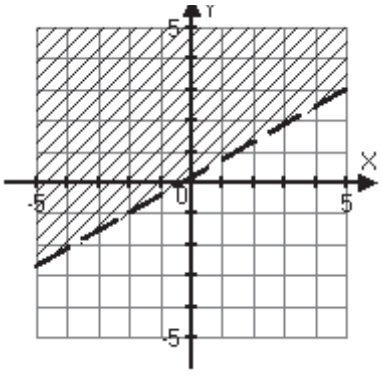
C



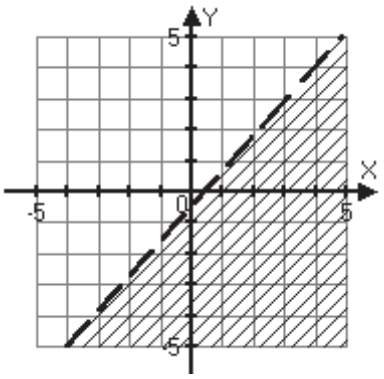
B



D



____ **210.** Which inequality represents the graph shown below?



A $y > \frac{8}{9}x - 2$

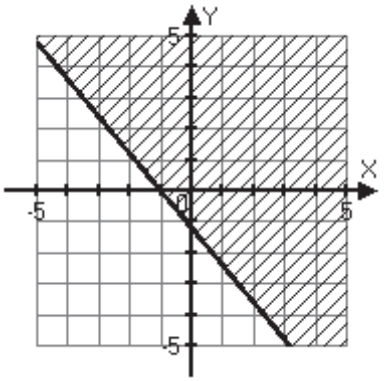
B $y < \frac{8}{9}x - 2$

C $y > \frac{9}{8}x - \frac{1}{2}$

D $y < \frac{9}{8}x - \frac{1}{2}$

____ **211.** OMIT

____ **212.** Which inequality represents the graph shown below?



A $y > -\frac{5}{6}x - \frac{5}{6}$

B $y > -\frac{6}{5}x - \frac{6}{5}$

C $y \geq -\frac{6}{5}x - \frac{6}{5}$

D $y \geq -\frac{5}{6}x - \frac{5}{6}$

A sports store makes a profit of $50 on every pair of cross-country skis sold and $125 on every set of snowshoes sold. The manager's goal is to have a profit of at least $700 a day from the sales of these two items.

____ **213.** If *x* represents the number of pairs of cross-country skis sold and *y* represents the number of pairs of snowshoes sold, what inequality models the combinations of ski and snowshoe sales that will meet or exceed the daily profit goal?

A $50y + 125x \leq 700$

B $50y + 125x > 700$

C $50x + 125y \geq 700$

D $50x - 125y < 700$

____ **214.** **OMIT**

A banquet room can seat up to 600 guests. Each rectangular table seats 11 guests and each circular table seats 6 guests. **Use this information to answer questions 215 & 216.**

____ **215.** If *r* represents the number of rectangular tables and *c* represents the number of circular tables, which inequality represents the possible combinations of rectangular and circular tables?

A $11r + 6y \leq 600$

B $11r + 6y < 600$

C $11r + 6y \geq 600$

D $11r + 6y > 600$

____ **216.** If the banquet organizers want to have **close to the same number of rectangular and circular tables**, what combination of tables could they use and still seat the maximum number of people?

A 24 rectangular and 24 circular tables

B 35 rectangular and 35 circular tables

C 37 rectangular and 37 circular tables

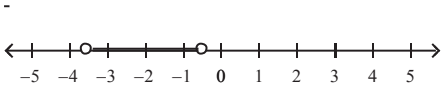
D 9 rectangular and 9 circular tables

____ **217.** What is the approximate solution to the inequality $3x^2 - 7.2x + 2 < 0$?

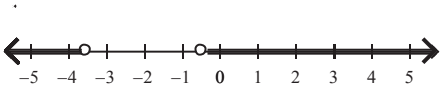
A $0.32 \leq x \leq 2.08$
B $0.32 < x < 2.08$
C $x \leq 0.32$ *or* $x \geq 2.08$
D $x < 0.32$ *or* $x > 2.08$

____ **218.** Which number line represents the solution set to the inequality $-2x^2 - 7.9x > 3$?

A


B


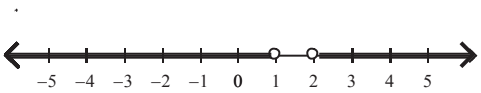
C

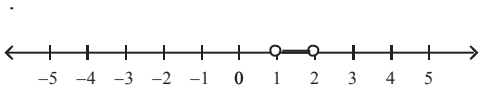

D


____ **219.** Which graph represents the solution to the inequality $2x^2 - 6x + 4 \geq 0$?

A


B


C


D


____ **220.** The solution set to the inequality $-2x^2 + 8x - 6 > 0$ is

A $\{x \mid 1 < x < 3, x \in \mathrm{R}\}$
B $\{x \mid -3 < x < -1, x \in R\}$
C $\{x \mid x < 1, x > 3, x \in R\}$
D $\{x \mid x < -3, x > -1, x \in \mathrm{R}\}$

____ **221.** The solution set to the inequality $-3x^2 \leq -9x + 6$ is

A $\{x \mid 1 \leq x \leq 2, x \in R\}$
B $\{x \mid -2 \leq x \leq -1, x \in R\}$
C $\{x \mid x \leq -2 \text{ or } x \geq -1, x \in R\}$
D $\{x \mid x \leq 1 \text{ or } x \geq 2, x \in R\}$

____ **222.** A rectangle is x centimetres wide and $2x$ centimetres long. If the area of the rectangle has to be between 46 cm^2 and 140 cm^2, what are the possible values of x?

A $\sqrt{23} \leq x \leq \sqrt{70}$
B $46 \leq x \leq 140$
C $2\sqrt{23} \leq x \leq 2\sqrt{70}$
D $23 \leq x \leq 70$

800 people will attend a concert if tickets cost $20 each. Attendance will decrease by 30 people for each $1 increase in the price. The concert promoters need to make a minimum of $12 800.
Use this information to answer questions 223 & 224.

____ **223.** What quadratic inequality represents this situation?

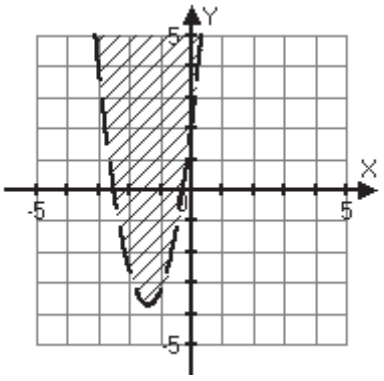
A $(800+x)(20-30x) \leq 12\,800$
B $(800+x)(20-30x) \geq 12\,800$
C $(20+x)(800-30x) \geq 12\,800$
D $(20-x)(800+30x) \leq 12\,800$

____ **224.** What is the range of ticket prices the concert promoters can charge and still make at least the minimum amount of money desired?

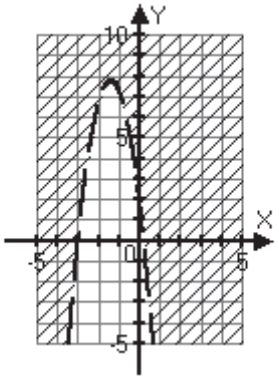
A $27.52 ≥ ticket price ≥ $5.81
B $12.48 ≤ ticket price ≤ $34.19
C ticket price ≤ $12.48 or ticket price ≥ $34.19
D ticket price ≥ $27.52 or ticket price ≤ $5.81

____ **225.** Which graph represents the solution to the inequality $y > 3x^2 + 8.3x + 2$?

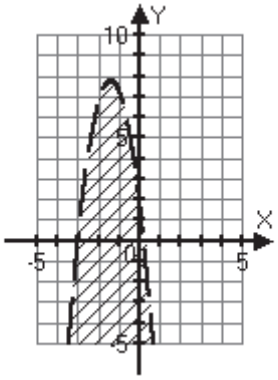
A



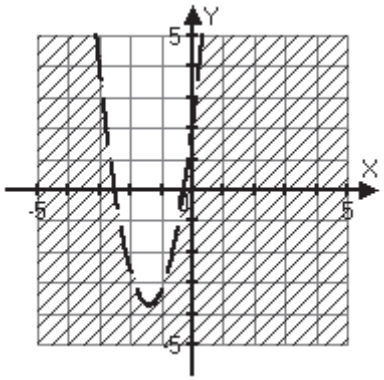
C



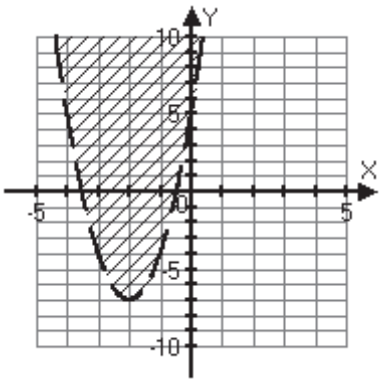
B



D



____226 - 228. OMIT



____ 229. Which quadratic inequality is represented by the graph shown right?

A $y > -3(x+2)^2 - 7$
B $y > 3(x+2)^2 - 7$
C $y > -3(x-7)^2 - 2$
D $y \leq 3(x-7)^2 - 2$

____ 230. Which point does ***not*** satisfy the inequality $y > -2(x-3)^2 + 8$?

A $(-9,-234)$
B $(1,1)$
C $(5,16)$
D $(2,0)$

A rock is thrown upward with an initial velocity of 14 m/s. The motion of the rock can be modelled by the equation $h(t) = -4.9t^2 + 14t$. **Use this information to answer questions 231 and 232.**

____ 231. To the nearest hundredth of a second, for what period of time is the rock's altitude greater than 6 m?

A $0\text{ s} \leq t \leq 2.86\text{ s}$
B $t < 0.53\text{ s}$ or $t > 2.33\text{ s}$
C $0.53\text{ s} < t < 2.33\text{ s}$
D $0.53\text{ s} \leq t \leq 2.33\text{ s}$

____ 232. For how long is the rock's altitude greater than 6 m? Answer to the nearest hundredth of a second.

A 2.86 s
B 1.81 s
C 2.33 s
D 0.53 s

Math 20-1 Year End Review
Answer Section

MULTIPLE CHOICE

1. ANS: C
2. ANS: A
3. ANS: D
4. ANS: D
5. ANS: B
6. ANS: C
7. ANS: A
8. ANS: B
9. ANS: C
10. ANS: A
11. ANS: A
12. ANS: A
13. ANS: C
14. ANS: D
15. ANS: C
16. ANS: B
17. ANS: B
18. ANS: D
19. ANS: A
20. ANS: D
21. ANS: C
22. ANS: C
23. ANS: D
24. ANS: B
25. ANS: C
26. ANS: D
27. ANS: D
28. ANS: B
29. ANS: A
30. ANS: C
31. ANS: D
32. ANS: C
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36. ANS: D
37. ANS: D
38. ANS: C
39. ANS: C
40. ANS: D
41. ANS: D
42. ANS: C
43. ANS: B
44. ANS: B
45. ANS: C
46. ANS: A
47. ANS: A
48. ANS: C
49. ANS: C
50. ANS: B
51. ANS: C
52. ANS: C
53. ANS: A
54. ANS: A
55. ANS: A
56. ANS: C
57. ANS: B
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59. ANS: B
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62. ANS: A
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