أسئلة اختيار من متعدد حول الدوال التربيعية – ملزمة هيكل ريفيل



تم تحميل هذا الملف من موقع المناهج الإماراتية	
موقع المناهج ⇦ المناهج الإماراتية ⇦ الصف الثاني عشر العام ⇦ رياضيات ⇦ الفصل الأول ⇦ ملخصات وتقارير ⇦ الملف	
تاريخ إضافة الملف على موقع المناهج: 2026-11-11 21:58:17	
المزيد من مادة رياضيات:	ملفات ا كتب للمعلم ا كتب للطالب ا اختبارات الكترونية ا اختبارات ا حلول ا عروض بوربوينت ا أوراق عمل منهج انجليزي ا ملخصات وتقارير ا مذكرات وبنوك ا الامتحان النهائي ا للمدرس
	إعداد: كرم أسعد

التواصل الاجتماعي بحسب الصف الثاني عشر العام					
صفحة المناهج الإماراتية على فيسبوك					
المواد على تلغرام	التربية الاسلامية	اللغة العربية	اللغة الانجليزية	الرياضيات	

المزيد من الملفات بحسب الصف الثاني عشر العام والمادة رياضيات في الفصل الأول	
1	أسئلة اختيار من متعدد حول الدوال التربيعية – ملزمة هيكل ريفيل
2	أسئلة في الجزء المقالي من الهيكل 2027
3	الهيكل الوزاري بريدج وريفيل 2027
4	ملزمة وفق هيكل اختبار نهاية الفصل - بريدج
5	نموذج لأسئلة الهيكل الوزاري الجزء الكتابي بدون الحل البنود 21 حتى 25

تحميل تطبيق المناهج للهواتف الذكية	
تطبيق المناهج على Store App (آبل)	تطبيق المناهج على Play Google (أندرويد)

أسئلة اختيار من متعدد حول الدوال التربيعية

تم تحميل هذا الملف من موقع المناهج الإماراتية	
موقع المناهج ⇦ المناهج الإماراتية ⇦ الصف الثاني عشر العام ⇦ رياضيات ⇦ الفصل الأول ⇦ ملفات متنوعة ⇦ الملف	
تاريخ إضافة الملف على موقع المناهج: 2026-11-06 23:27:33	
المزيد من مادة رياضيات:	ملفات ا كتب للمعلم ا كتب للطالب ا اختبارات الكترونية ا اختبارات ا حلول ا عروض بوربوينت ا أوراق عمل منهج انجليزي ا ملخصات وتقارير ا مذكرات وبنوك ا الامتحان النهائي ا للمدرس
	إعداد: كرم أسعد

التواصل الاجتماعي بحسب الصف الثاني عشر العام					
صفحة المناهج الإماراتية على فيسبوك					
المواد على تلغرام	التربية الاسلامية	اللغة العربية	اللغة الانجليزية	الرياضيات	

المزيد من الملفات بحسب الصف الثاني عشر العام والمادة رياضيات في الفصل الأول	
1	الهيكل الوزاري 2027 - بريدج وريفيل
2	أسئلة الهيكل الوزاري الجزء الكتابي لحل المعادلات التربيعية بإكمال المربع (غير محلول)
3	حل أسئلة الهيكل الوزاري لإكمال المربع
4	أسئلة الهيكل الوزاري لتحليل خواص الدوال التربيعية
5	أسئلة الهيكل الوزاري الجزء الإلكتروني مع الحل

تحميل تطبيق المناهج للهواتف الذكية	
تطبيق المناهج على Store App (آبل)	تطبيق المناهج على Play Google (أندرويد)

ملزمة هيكل 12 عام

(ريفيل)

2026-2027

Mathematics

الترم الاول



إعداد

أ / كرم أسعد

@MR_KARAM_ASAAD

لا تتردد في التواصل معنا والاستعداد للامتحان بكل ثقة

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Multiple Choice Questions — أسئلة اختيار من متعدد

Q	LEARNING OUTCOME	REVEAL (ENGLISH)	PAGE
Q1	Analyze the characteristics of the graphs of quadratic functions	Key Concept • Graph of a Quadratic Function	3

1 A quadratic function has the form $y = ax^2 + bx + c$, where $a \neq 0$. What is the equation of the axis of symmetry of $y = 2x^2 - 8x + 3$?

(A) $x = 2$ (B) $x = 4$ (C) $x = -2$ (D) $x = -4$

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2 What is the y-intercept of the graph of $y = -3x^2 + 5x - 7$?

(A) 5 (B) -3 (C) -7 (D) 7

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3 Find the vertex of the graph of $y = x^2 + 6x + 5$.

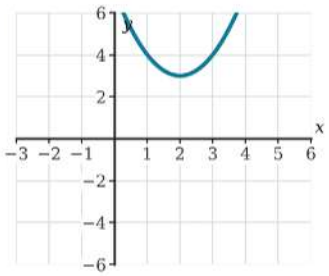
(A) $(-6, 5)$ (B) $(-3, 4)$ (C) $(-3, -4)$ (D) $(3, -4)$

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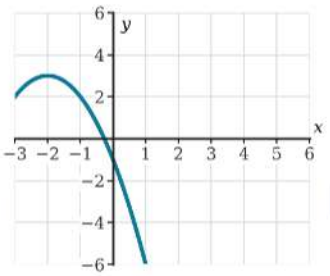
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4 Which graph represents $y = -x^2 + 4x - 1$?

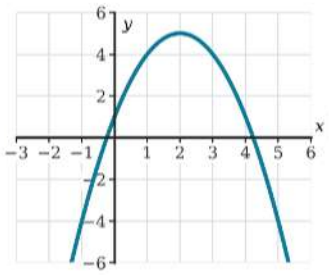
A



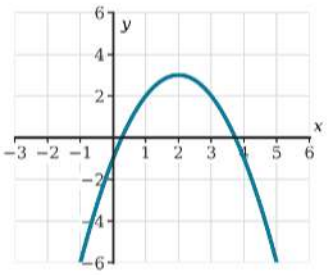
B



C



D



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5 Which statement about the graph of $y = -2x^2 + 8x - 5$ is true?

A It opens upward, its axis of symmetry is $x = 2$, and its minimum value is 3.

B It opens downward, its axis of symmetry is $x = 2$, and its maximum value is 3.

C It opens downward, its axis of symmetry is $x = 2$, and its y-intercept is 5.

D It opens downward, its axis of symmetry is $x = -2$, and its maximum value is 3.

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Q	LEARNING OUTCOME	REVEAL (ENGLISH)	PAGE
Q2	Graph quadratic functions	(2,3)	9

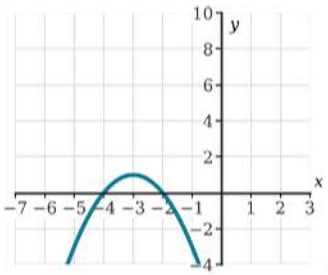
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Graph each function. Then state the domain and range.

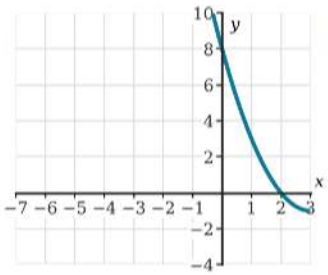
6 Book #1

1. Which graph represents $f(x) = x^2 + 6x + 8$?

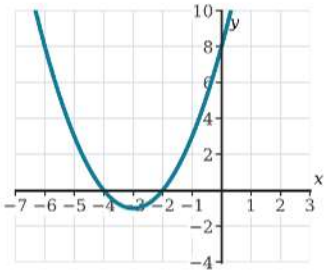
A



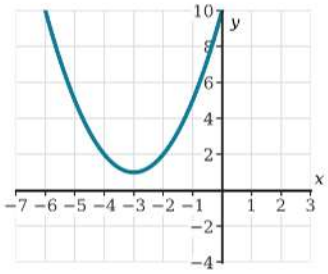
B



C



D



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7 Book #1

1. What are the domain and range of $f(x) = x^2 + 6x + 8$?

A Domain: $x \geq -3$; Range: all real numbers

B Domain: all real numbers; Range: $y \leq -1$

C Domain: all real numbers; Range: $y \geq -1$

D Domain: all real numbers; Range: $y \geq -3$

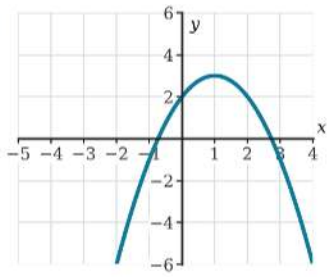
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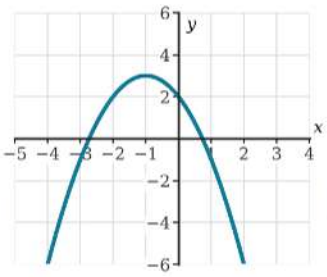
8 Book #2

2. Which graph represents $f(x) = -x^2 - 2x + 2$?

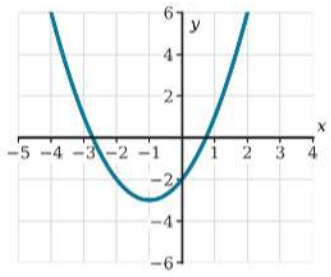
(A)



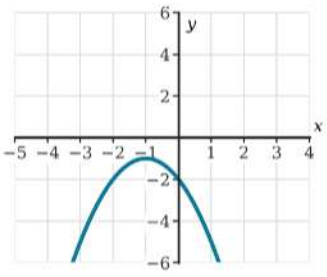
(B)



(C)



(D)



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9 Book #2

2. What are the domain and range of $f(x) = -x^2 - 2x + 2$?

(A) Domain: all real numbers; Range: $y \geq 3$

(B) Domain: all real numbers; Range: $y \leq 3$

(C) Domain: $x \leq 3$; Range: all real numbers

(D) Domain: all real numbers; Range: $y \leq -1$

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Q	LEARNING OUTCOME	REVEAL (ENGLISH)	PAGE
Q3	Solve quadratic equations by graphing	Example 1 Example 2	13 14

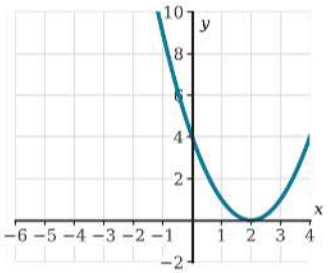
10 Solve $10 - x^2 = 4x + 14$ by graphing. First, rearrange the terms so that one side of the equation is 0. Which equation results?

(A) $0 = x^2 + 4x + 4$ (B) $0 = x^2 - 4x + 4$ (C) $0 = x^2 + 4x - 24$ (D) $0 = -x^2 + 4x + 4$

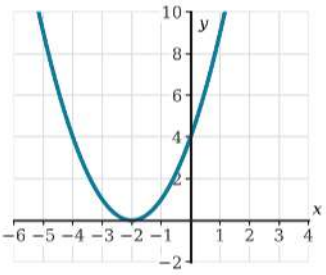
مساحة الحل • Working space

11 The related function of $0 = x^2 + 4x + 4$ is $f(x) = x^2 + 4x + 4$. Which graph shows it?

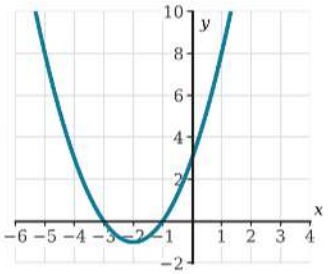
(A)



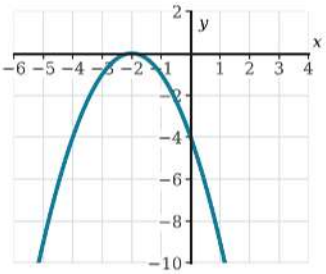
(B)



(C)



(D)



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12 What is the solution of $10 - x^2 = 4x + 14$?

(A) $x = -2$ or $x = 2$ (B) No real solution

(C) $x = 2$ (one real solution) (D) $x = -2$ (one real solution)

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13 Which quadratic equation can be used to find two real numbers with a sum of 24 and a product of 143?

(A) $x^2 - 24x - 143 = 0$

(B) $x^2 + 24x + 143 = 0$

(C) $x^2 - 24x + 143 = 0$

(D) $x^2 - 143x + 24 = 0$

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14 Use a quadratic equation to find two real numbers with a sum of 24 and a product of 143. What are the numbers?

(A) 12 and 12

(B) 11 and 13

(C) 10 and 14

(D) 9 and 15

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Q	LEARNING OUTCOME	REVEAL (ENGLISH)	PAGE
Q4	Solve quadratic equations by factoring	Example 2	28

15 Solve $x^2 - 6x - 9 = 18$ by factoring. Which is the equation in standard form?

(A) $x^2 - 6x - 9 = 0$

(B) $x^2 + 6x - 27 = 0$

(C) $x^2 - 6x - 27 = 0$

(D) $x^2 - 6x + 9 = 0$

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16 Which is the factored form of $x^2 - 6x - 27 = 0$?

(A) $(x + 9)(x - 3) = 0$

(B) $(x - 9)(x - 3) = 0$

(C) $(x - 27)(x + 1) = 0$

(D) $(x - 9)(x + 3) = 0$

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17 Solve $x^2 - 6x - 9 = 18$ by factoring.

(A) $x = 9$ or $x = -3$ (B) $x = -9$ or $x = 3$ (C) $x = 9$ or $x = 3$ (D) $x = 27$ or $x = -1$

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18 Check the solution $x = -3$ in the original equation $x^2 - 6x - 9 = 18$. What is the value of the left side when $x = -3$?

(A) 0 (B) -18 (C) 18 (D) 36

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Q	LEARNING OUTCOME	REVEAL (ENGLISH)	PAGE
Q5	Complete the square in the case of a trinomial that is not a perfect square	Example 4	35

19 To make $x^2 + bx + c$ a perfect square trinomial, the value of c must be:

(A) $2b$ (B) $\left(\frac{b}{2}\right)^2$ (C) $\frac{b}{2}$ (D) b^2

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20 Find the value of c that makes $x^2 - 7x + c$ a perfect square.

(A) 3.5 (B) 49 (C) 7 (D) 12.25

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21 Write $x^2 - 7x + 12.25$ as a perfect square trinomial.

(A) $(x + 3.5)^2$ (B) $(x - 12.25)^2$ (C) $(x - 7)^2$ (D) $(x - 3.5)^2$

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Q	LEARNING OUTCOME	REVEAL (ENGLISH)	PAGE
Q6	Solve quadratic equations by using the Quadratic Formula	Example 1 Example 2	43 44

22 **CONTEST** At the World Championship Punkin Chunkin contest in Bridgeville, Delaware, pumpkins are launched hundreds of yards. The path of a pumpkin can be modeled by $h = -4.9t^2 + 11.7t + 42$, where h is the height and t is the number of seconds after launch.

Part A To solve $0 = -4.9t^2 + 11.7t + 42$ with the Quadratic Formula, what is the value of the discriminant $b^2 - 4ac$?

(A) ≈ 823.2 (B) ≈ -686.31 (C) ≈ 960.09 (D) ≈ 136.89

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23 **CONTEST** At the World Championship Punkin Chunkin contest in Bridgeville, Delaware, pumpkins are launched hundreds of yards. The path of a pumpkin can be modeled by $h = -4.9t^2 + 11.7t + 42$, where h is the height and t is the number of seconds after launch.

Part A Use the Quadratic Formula to solve $0 = -4.9t^2 + 11.7t + 42$. Round to the nearest tenth.

(A) $t \approx 2.4$ or $t \approx -1.2$ (B) $t \approx -4.4$ or $t \approx 2.0$

(C) $t \approx 4.4$ or $t \approx -2.0$ (D) $t \approx 4.4$ or $t \approx 2.0$

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24 **CONTEST** At the World Championship Punkin Chunkin contest in Bridgeville, Delaware, pumpkins are launched hundreds of yards. The path of a pumpkin can be modeled by $h = -4.9t^2 + 11.7t + 42$, where h is the height and t is the number of seconds after launch.

Part B Interpret the roots. Which root makes sense in this context, and why?

(A) $t \approx -2.0$: the pumpkin was in the air 2 seconds before it was launched.

(B) Both roots make sense, because a quadratic equation always has two valid solutions.

(C) $t \approx 4.4$ is the time the pumpkin reaches its greatest height.

(D) $t \approx 4.4$: the pumpkin lands after about 4.4 seconds; the negative root makes no sense because the pumpkin launches at 0 seconds.

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25 Solve $x^2 + 4x - 17 = 0$ by using the Quadratic Formula.

(A) $x = 2 \pm \sqrt{21}$ (B) $x = -2 \pm \sqrt{21}$ (C) $x = -4 \pm \sqrt{21}$ (D) $x = -2 \pm \sqrt{13}$

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Q	LEARNING OUTCOME	REVEAL (ENGLISH)	PAGE
Q7	Use the discriminant to determine the number and type of roots of a quadratic equation	Key Concept • Discriminant	45

26 For $ax^2 + bx + c = 0$ with rational coefficients, if $b^2 - 4ac > 0$ and $b^2 - 4ac$ is a perfect square, the equation has:

(A) 2 complex roots (B) 1 real, rational root

(C) 2 real, irrational roots (D) 2 real, rational roots

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27 Use the discriminant to determine the number and type of roots of $2x^2 + 3x + 5 = 0$.

(A) 2 real, irrational roots

(B) 2 real, rational roots

(C) 1 real, rational root

(D) 2 complex roots

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28 Use the discriminant to determine the number and type of roots of $3x^2 - 2x - 5 = 0$.

(A) 2 complex roots

(B) 2 real, rational roots

(C) 1 real, rational root

(D) 2 real, irrational roots

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29 Use the discriminant to determine the number and type of roots of $x^2 + 4x - 17 = 0$.

(A) 2 real, irrational roots

(B) 1 real, rational root

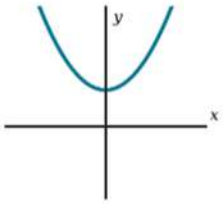
(C) 2 real, rational roots

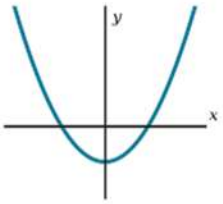
(D) 2 complex roots

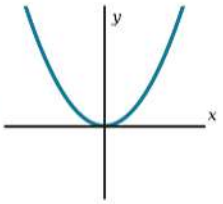
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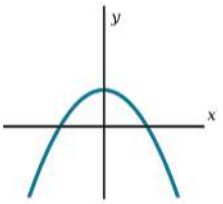
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30 Which graph could represent a quadratic function $y = ax^2 + bx + c$ with $a > 0$ and $b^2 - 4ac < 0$?

(A) 

(B) 

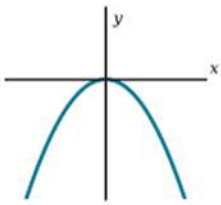
(C) 

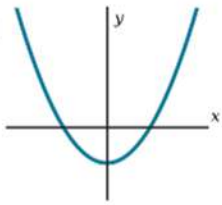
(D) 

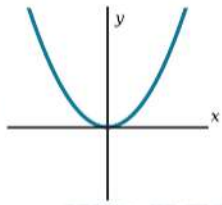
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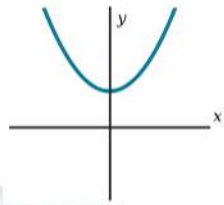
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31 Which graph could represent a quadratic function $y = ax^2 + bx + c$ with $a > 0$ and $b^2 - 4ac = 0$?

(A) 

(B) 

(C) 

(D) 

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Q	LEARNING OUTCOME	REVEAL (ENGLISH)	PAGE
Q8	Graph quadratic inequalities in two variables	Example 1 Example 2	51 52

32 The boundary of the graph of $y \leq x^2 - 2x + 8$ should be drawn as a ____ parabola, and the region ____ it is shaded.

(A) dashed; below

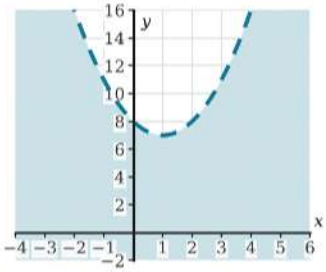
(B) solid; below

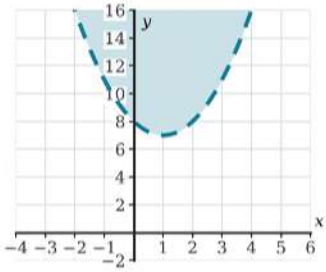
(C) solid; above

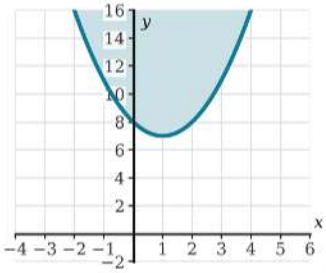
(D) dashed; above

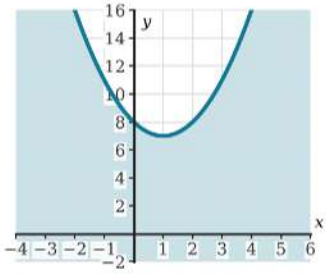
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33 Which graph represents $y \leq x^2 - 2x + 8$?

(A) 

(B) 

(C) 

(D) 

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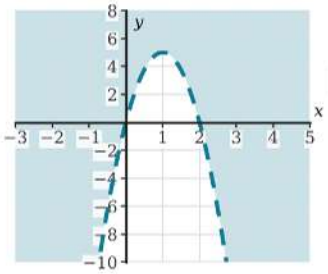
34 Which ordered pair is a solution of $y \leq x^2 - 2x + 8$?

(A) $(0, 0)$ (B) $(0, 10)$ (C) $(1, 8)$ (D) $(2, 9)$

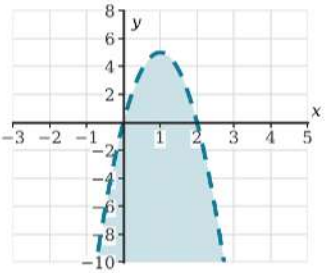
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35 Which graph represents $y > -5x^2 + 10x$?

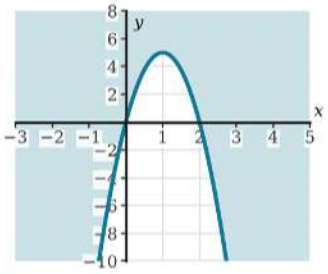
(A)



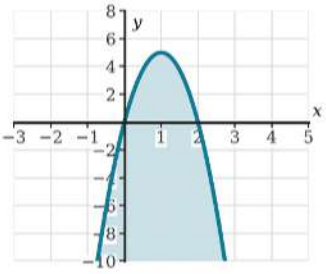
(B)



(C)



(D)



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36 Which ordered pair is a solution of $y > -5x^2 + 10x$?

(A) $(1, 5)$ (B) $(1, 0)$ (C) $(2, -3)$ (D) $(1, 6)$

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Q	LEARNING OUTCOME	REVEAL (ENGLISH)	PAGE
Q9	Graph and analyze polynomial functions	(8-10)	79

State the degree and leading coefficient of each polynomial in one variable. If it is not a polynomial in one variable, explain why.

37 Book #7

7. $n + 8$

(A) Degree 0, leading coefficient 8

(B) Degree 1, leading coefficient 8

(C) Degree 8, leading coefficient 1

(D) Degree 1, leading coefficient 1

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38 Book #8

8. $(2x - 1)(4x^2 + 3)$

(A) Degree 2, leading coefficient 4

(B) Degree 3, leading coefficient 8

(C) Degree 3, leading coefficient 4

(D) Degree 3, leading coefficient 2

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39 Book #9

9. $-5x^5 + 3x^3 - 8$

(A) Degree 3, leading coefficient 3

(B) Degree 5, leading coefficient -8

(C) Degree 5, leading coefficient -5

(D) Degree 5, leading coefficient 5

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40 Book #10

10. $18 - 3y + 5y^2 - y^5 + 7y^6$

(A) Degree 6, leading coefficient 7

(B) Degree 6, leading coefficient 18

(C) Degree 6, leading coefficient -1

(D) Degree 5, leading coefficient -1

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Book #11

11. $u^3 + 4u^2t^2 + t^4$

(A) Polynomial in one variable: degree 3, leading coefficient 1.

(B) Polynomial in one variable: degree 4, leading coefficient 1.

(C) Not a polynomial in one variable: it has two variables, *u* and *t*.

(D) Not a polynomial: it contains a negative exponent.

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Book #12

12. $2r - r^2 + \frac{1}{r^2}$

(A) Polynomial: degree 2, leading coefficient 2.

(B) Not a polynomial: $\frac{1}{r^2} = r^{-2}$ has a negative exponent.

(C) Not a polynomial: it has two terms with the same degree.

(D) Polynomial: degree 2, leading coefficient −1.

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Q	LEARNING OUTCOME	REVEAL (ENGLISH)	PAGE
Q10	Graph and analyze power functions	Key Concept • End Behavior of a Monomial Function	73

43

What is the end behavior of $f(x) = 3x^6$? (even degree, positive leading coefficient)

(A) As $x \to -\infty,\ f(x) \to -\infty$ and as $x \to \infty,\ f(x) \to -\infty$

(B) As $x \to -\infty,\ f(x) \to -\infty$ and as $x \to \infty,\ f(x) \to \infty$

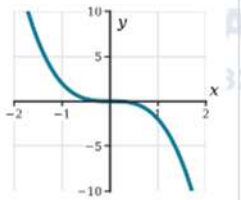
(C) As $x \to -\infty,\ f(x) \to \infty$ and as $x \to \infty,\ f(x) \to -\infty$

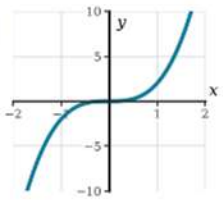
(D) As $x \to -\infty,\ f(x) \to \infty$ and as $x \to \infty,\ f(x) \to \infty$

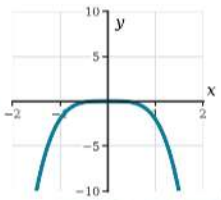
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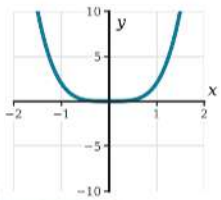
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44 Which graph could represent $f(x) = -2x^3$?

(A) 

(B) 

(C) 

(D) 

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45 What are the domain and range of $f(x) = -x^4$?

(A) Domain: $x \leq 0$; Range: all real numbers

(B) Domain: all real numbers; Range: $y \geq 0$

(C) Domain: all real numbers; Range: $y \leq 0$

(D) Domain: all real numbers; Range: all real numbers

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46 Which function has the end behavior: as $x \to -\infty,\ f(x) \to -\infty$ and as $x \to \infty,\ f(x) \to \infty$?

(A) $f(x) = \frac{1}{2}x^5$ (B) $f(x) = -\frac{1}{2}x^4$ (C) $f(x) = -\frac{1}{2}x^5$ (D) $f(x) = \frac{1}{2}x^4$

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Q	LEARNING OUTCOME	REVEAL (ENGLISH)	PAGE
Q11	Graph polynomial functions and locate their zeros	(1-4)	89

Determine the consecutive integer values of *x* between which each real zero of each function is located by using a table. Then sketch the graph.

47 Book #1

1. $f(x) = x^2 + 3x - 1$

(A) Between -4 and -3; and between 0 and 1

(B) Only between 0 and 1

(C) Between -1 and 0; and between 2 and 3

(D) Between -3 and -2; and between 1 and 2

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48 Book #2

2. $f(x) = -x^3 + 2x^2 - 4$

(A) One real zero, between 1 and 2

(B) Two real zeros, between -2 and -1 and between 1 and 2

(C) One real zero, between 0 and 1

(D) One real zero, between -2 and -1

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Book #3

3. $f(x) = x^3 + 4x^2 - 5x + 5$

(A) One real zero, between -6 and -5

(B) One real zero, between -1 and 0

(C) Three real zeros, between -6 and -5, -1 and 0, 1 and 2

(D) One real zero, between -5 and -4

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Book #4

4. $f(x) = -x^4 - x^3 + 4$

(A) Between -1 and 0; and between 0 and 1

(B) Between -2 and -1; and between 1 and 2

(C) Only between 1 and 2

(D) Between -3 and -2; and between 2 and 3

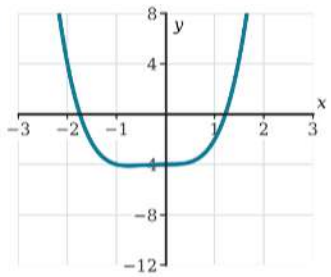
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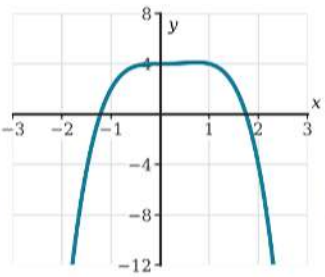
51 Book #4

4. Which sketch represents $f(x) = -x^4 - x^3 + 4$?

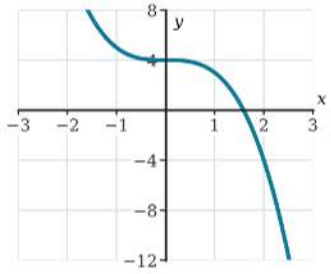
(A)



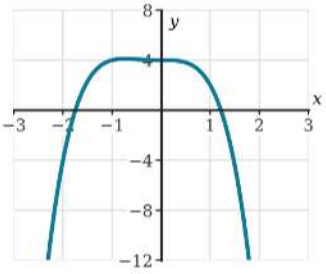
(B)



(C)



(D)



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Q	LEARNING OUTCOME	REVEAL (ENGLISH)	PAGE
Q12	Find the relative maxima and minima of polynomial functions	Example 2	84

52 Use a table to graph $f(x) = x^3 + x^2 - 5x - 2$. What are the values of $f(-2)$ and $f(1)$?

(A) $f(-2) = 4$ and $f(1) = -3$

(B) $f(-2) = 4$ and $f(1) = -5$

(C) $f(-2) = -4$ and $f(1) = -5$

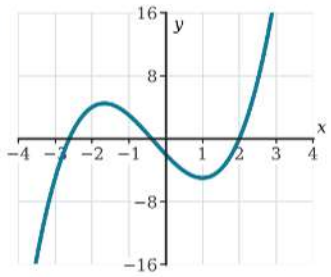
(D) $f(-2) = -14$ and $f(1) = -7$

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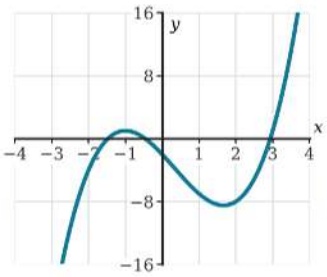
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53 Which graph represents $f(x) = x^3 + x^2 - 5x - 2$?

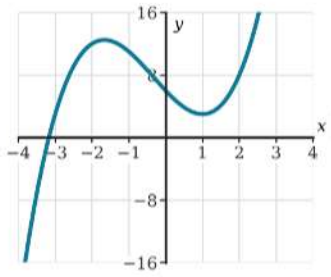
(A)



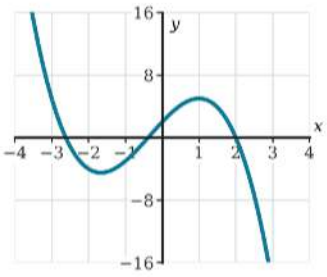
(B)



(C)



(D)



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54 Based on the table of values of $f(x) = x^3 + x^2 - 5x - 2$, where do the relative maximum and relative minimum occur?

(A) Maximum near $x = 0$; minimum near $x = 2$

(B) Maximum near $x = 1$; minimum near $x = -2$

(C) Maximum near $x = -2$; minimum near $x = 1$

(D) Maximum near $x = -2$; minimum near $x = 3$

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55 Why does a relative maximum occur near $x = -2$ for $f(x) = x^3 + x^2 - 5x - 2$?

(A) Because $x = -2$ is the smallest x-value in the table

(B) Because $f(-2)$ is positive

(C) $f(-2) = 4$ is greater than the surrounding values $f(-3) = -5$ and $f(-1) = 3$

(D) $f(-2) = 4$ is less than the surrounding values $f(-3) = -5$ and $f(-1) = 3$

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Q	LEARNING OUTCOME	REVEAL (ENGLISH)	PAGE
Q13	Divide polynomials using long division	Example 1	102

56 Find $(24a^4b^3 + 18a^2b^2 - 30ab^3)(6ab)^{-1}$. Which expression is equivalent to the division being performed?

(A) $(24a^4b^3 + 18a^2b^2 - 30ab^3) - (6ab)$

(B) $(24a^4b^3 + 18a^2b^2 - 30ab^3) \cdot (6ab)$

(C) $(6ab) \div (24a^4b^3 + 18a^2b^2 - 30ab^3)$

(D) $(24a^4b^3 + 18a^2b^2 - 30ab^3) \div (6ab)$

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57 When dividing $24a^4b^3$ by $6ab$, what is the first term of the quotient?

(A) $4a^3b^2$ (B) $4a^5b^4$ (C) $4a^4b^3$ (D) $18a^3b^2$

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58 Find $(24a^4b^3 + 18a^2b^2 - 30ab^3)(6ab)^{-1}$.

(A) $4a^3b^2 + 3ab - 5b^3$

(B) $4a^3b^2 + 3a^2b^2 - 5b^2$

(C) $4a^5b^4 + 3a^3b^3 - 5a^2b^4$

(D) $4a^3b^2 + 3ab - 5b^2$

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Q	LEARNING OUTCOME	REVEAL (ENGLISH)	PAGE
Q14	Divide polynomials using synthetic division	Example 4	103

59 Use synthetic division to find $(3x^3 - 2x^2 - 53x - 60) \div (x + 3)$. Which value of k is used in the synthetic division box?

(A) $k = 3$ (B) $k = -3$ (C) $k = -60$ (D) $k = 60$

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60 Which is the correct synthetic division set-up for $(3x^3 - 2x^2 - 53x - 60) \div (x + 3)$?

(A) $-3 \mid 3 \quad -2 \quad -53$

(B) $-3 \mid 3 \quad 2 \quad 53 \quad 60$

(C) $-3 \mid 3 \quad -2 \quad -53 \quad -60$

(D) $3 \mid 3 \quad -2 \quad -53 \quad -60$

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61 What is the quotient of $(3x^3 - 2x^2 - 53x - 60) \div (x + 3)$?

(A) $3x^2 - 11x + 20$

(B) $3x^2 - 5x - 68$

(C) $3x^2 - 11x - 20$

(D) $3x^2 + 11x - 20$

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62 The remainder of $(3x^3 - 2x^2 - 53x - 60) \div (x + 3)$ is 0. What does this tell you?

(A) $x = 3$ is a zero of the polynomial.

(B) $x + 3$ is a factor of $3x^3 - 2x^2 - 53x - 60$ and $x = -3$ is a zero.

(C) The polynomial has no real zeros.

(D) $x + 3$ is not a factor of the polynomial.

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Q	LEARNING OUTCOME	REVEAL (ENGLISH)	PAGE
Q15	Solve polynomial equations by factoring	(39,40,43,45)	129

Solve each equation.

63 Book #39

39. Which is the factored form of $x^3 + 216 = 0$? (Sum of cubes)

(A) $(x + 6)(x^2 - 6x + 36) = 0$

(B) $(x + 6)(x^2 + 6x + 36) = 0$

(C) $(x - 6)(x^2 + 6x + 36) = 0$

(D) $(x + 6)^3 = 0$

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Book #39

39. Solve $x^3 + 216 = 0$.

(A) $x = -6$ or $x = -3 \pm 3i\sqrt{3}$

(B) $x = 6$ or $x = -3 \pm 3i\sqrt{3}$

(C) $x = -6$ or $x = 3 \pm 3i\sqrt{3}$

(D) $x = -6$ only

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65

Book #43

43. Solve $20x^4 - 53x^2 + 18 = 0$.

(A) $x = \pm\frac{3}{2}$ only

(B) $x = \pm\frac{9}{4}$ or $x = \pm\frac{2}{5}$

(C) $x = \pm\frac{2}{3}$ or $x = \pm\frac{\sqrt{10}}{2}$

(D) $x = \pm\frac{3}{2}$ or $x = \pm\frac{\sqrt{10}}{5}$

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66 Book #40

40. Which is the factored form of $64x^3 + 1 = 0$?

(A) $(4x+1)(16x^2+4x+1)=0$

(B) $(4x+1)(16x^2-4x+1)=0$

(C) $(4x-1)(16x^2+4x+1)=0$

(D) $(8x+1)(8x^2-x+1)=0$

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67 Book #40

40. Find the real solution of $64x^3 + 1 = 0$.

(A) $x=-\frac{1}{4}$ (B) $x=-4$ (C) $x=-\frac{1}{8}$ (D) $x=\frac{1}{4}$

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68 Book #45

45. Solve $8x^4 - 18x^2 + 4 = 0$.

(A) $x=\pm\frac{1}{2}$ only

(B) $x=\pm\frac{1}{2}$ or $x=\pm 2$

(C) $x=\pm\frac{1}{2}$ or $x=\pm\sqrt{2}$

(D) $x=\pm\frac{1}{4}$ or $x=\pm\sqrt{2}$

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Q	LEARNING OUTCOME	REVEAL (ENGLISH)	PAGE
Q16	Graph exponential growth functions	(7,10)	221

Graph each function.

69 Book #7

7. $f(x) = 4^{x+1} - 5$. What is the equation of the horizontal asymptote?

(A) $y = 5$ (B) $y = -5$ (C) $y = 0$ (D) $y = -1$

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70 Book #7

7. What is the y-intercept of $f(x) = 4^{x+1} - 5$?

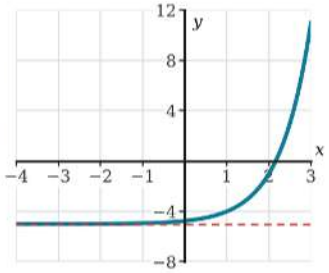
(A) $(0, -1)$ (B) $(0, -4)$ (C) $(0, 4)$ (D) $(0, -5)$

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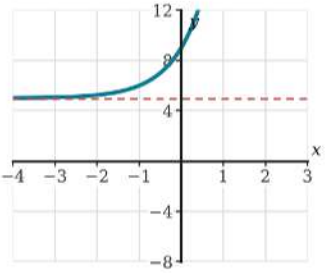
71 Book #7

7. Which graph represents $f(x) = 4^{x+1} - 5$?

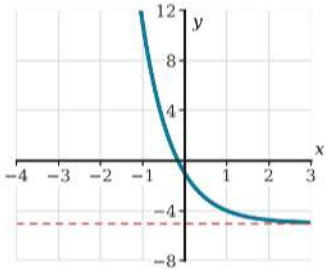
(A)



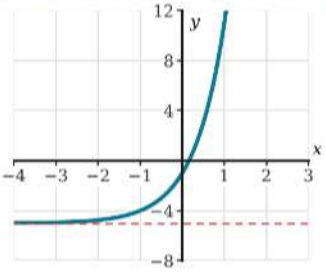
(B)



(C)



(D)



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72 Book #10

10. What are the domain and range of $f(x) = 1.5(2)^x + 6$?

(A) Domain: $x > 6$; Range: all real numbers

(B) Domain: all real numbers; Range: $y > 6$

(C) Domain: all real numbers; Range: $y < 6$

(D) Domain: all real numbers; Range: $y > 0$

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73 Book #10

10. What is the y-intercept of $f(x) = 1.5(2)^x + 6$?

(A) $(0, 1.5)$ (B) $(0, 9)$ (C) $(0, 6)$ (D) $(0, 7.5)$

مساحة الحل • Working space

Q	LEARNING OUTCOME	REVEAL (ENGLISH)	PAGE
Q17	Graph growth and decay functions	Example 6 Example 7	219 220

74

Example 6. Graph $f(x) = \left(\frac{1}{2}\right)^x$. What are the domain and range?

(A) Domain: all positive real numbers; Range: all real numbers

(B) Domain: all real numbers; Range: $y < 0$

(C) Domain: all real numbers; Range: all positive real numbers

(D) Domain: all real numbers; Range: all real numbers

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75 What are the y-intercept and the asymptote of $f(x) = \left(\frac{1}{2}\right)^x$?

(A) $(0, 1)$; asymptote $y = 0$

(B) $(0, \frac{1}{2})$; asymptote $y = 0$

(C) $(0, 0)$; asymptote $y = 1$

(D) $(0, 1)$; asymptote $x = 0$

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76 What is the end behavior of $f(x) = \left(\frac{1}{2}\right)^x$?

(A) As $x \to -\infty$, $f(x) \to 0$ and as $x \to \infty$, $f(x) \to \infty$

(B) As $x \to -\infty$, $f(x) \to -\infty$ and as $x \to \infty$, $f(x) \to 0$

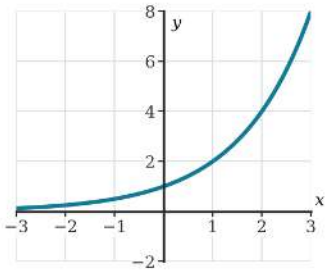
(C) As $x \to -\infty$, $f(x) \to \infty$ and as $x \to \infty$, $f(x) \to -\infty$

(D) As $x \to -\infty$, $f(x) \to \infty$ and as $x \to \infty$, $f(x) \to 0$

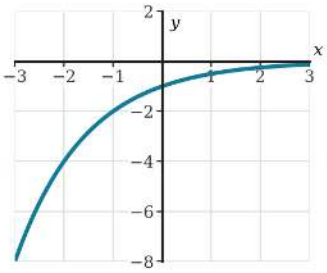
مساحة الحل • Working space

77 Which graph represents $f(x) = \left(\frac{1}{2}\right)^x$?

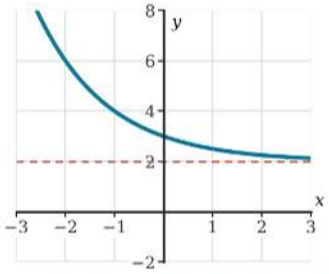
(A)



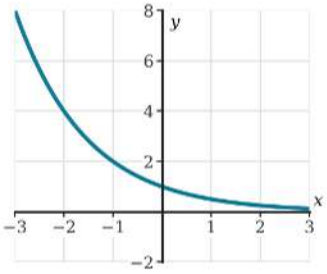
(B)



(C)



(D)



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78 **Example 7.** $g(x) = -2\left(\frac{1}{4}\right)^{x-4} + 3$ is a transformation of $f(x) = \left(\frac{1}{4}\right)^{x}$. Which describes the transformation?

(A) Reflect in the *x*-axis and stretch vertically; translate 4 units right and 3 units up

(B) Reflect in the *y*-axis and stretch vertically; translate 4 units left and 3 units up

(C) Stretch vertically only; translate 4 units right and 3 units up

(D) Reflect in the *x*-axis and stretch vertically; translate 4 units left and 3 units down

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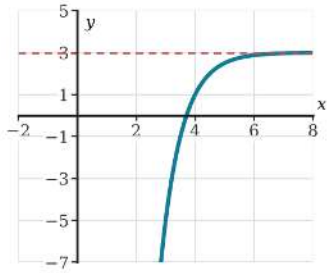
79 What is the equation of the horizontal asymptote of $g(x) = -2\left(\frac{1}{4}\right)^{x-4} + 3$?

(A) $y = 0$ (B) $y = 4$ (C) $y = 3$ (D) $y = -3$

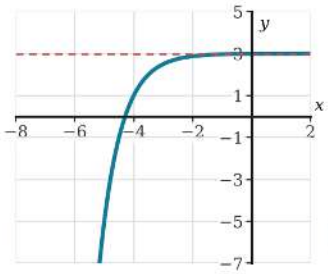
مساحة الحل • Working space

80 Which graph represents $g(x) = -2\left(\frac{1}{4}\right)^{x-4} + 3$?

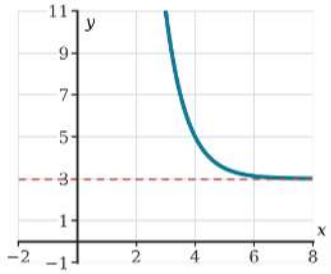
(A)



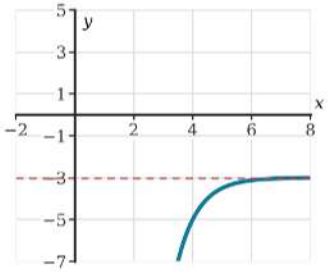
(B)



(C)



(D)



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Q	LEARNING OUTCOME	REVEAL (ENGLISH)	PAGE
Q18	Classify and determine study types	Learn Types of Studies	372

81 A researcher asks 200 students to report how many hours they spend on homework each week. What type of study is this?

(A) Control group (B) Experiment (C) Observational study (D) Survey

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82 A sample of 60 plants is divided randomly into two groups. One group receives a new fertilizer and the other does not, and then the growth of both groups is compared. What type of study is this?

(A) Census (B) Experiment (C) Observational study (D) Survey

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83 A scientist counts the number of birds that visit a feeder each day without affecting them in any way. What type of study is this?

(A) Observational study (B) Experiment (C) Survey (D) Experimental group

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84 In an experiment, the group that does **not** receive the treatment and is used for comparison is called the:

(A) experimental group (B) random sample (C) control group (D) population

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85 Why does each type of study rely on random selection of a sample?

(A) To make sure everyone in the sample agrees

(B) To make the sample as large as possible

(C) To ensure that the sample accurately represents the population

(D) To make the results favor the researcher

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Q	LEARNING OUTCOME	REVEAL (ENGLISH)	PAGE
Q19	Classify and analyze samples (identify biased questions)	Example 3	372

86 **FOOD** A restaurant owner wants to determine which kinds of meals she should add to her menu: vegetarian options or more traditional meat-based dishes. She releases a survey to her customers asking the following question: *Do you prefer a plain salad or a delicious steak?*

Step 1 What is the purpose of the question?

(A) To determine which dishes are most popular with customers

(B) To find out how many customers are vegetarian

(C) To decide how large the restaurant should be

(D) To determine how much customers will pay for a meal

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87 **FOOD** A restaurant owner wants to determine which kinds of meals she should add to her menu: vegetarian options or more traditional meat-based dishes. She releases a survey to her customers asking the following question: *Do you prefer a plain salad or a delicious steak?*

Step 2 Identify the bias in the question.

(A) The question is only given to customers who like salad

(B) The question asks about too many dishes at once

(C) There is no bias; both choices are described fairly

(D) The description of the steak ("delicious") favors it over the salad ("plain")

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88 **FOOD** A restaurant owner wants to determine which kinds of meals she should add to her menu: vegetarian options or more traditional meat-based dishes. She releases a survey to her customers asking the following question: *Do you prefer a plain salad or a delicious steak?*

Which rewording removes the bias?

(A) Don't you agree that a delicious steak is better than a salad?

(B) Which would you prefer to order: a salad or a steak?

(C) Do you prefer a healthy salad or a greasy steak?

(D) Do you prefer a plain salad or a juicy steak?

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89 To get an accurate result, how should the owner choose the customers who receive the survey?

(A) Ask only customers who order steak

(B) Randomly select customers from all those who visit the restaurant

(C) Ask only the first five customers each day

(D) Ask only the owner's friends and family

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Q	LEARNING OUTCOME	REVEAL (ENGLISH)	PAGE
Q20	Find the area under normal distribution curves	Key Concept • The Empirical Rule	396

90 Which statement is true for a normal distribution?

(A) The mean, median, and mode are equal and located at the center.

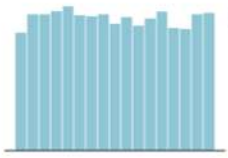
(B) The total area under the curve is 50%.

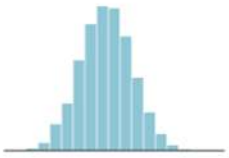
(C) The curve touches the x-axis at both ends.

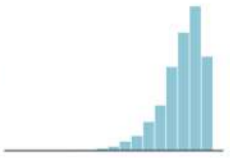
(D) The mean is always greater than the median.

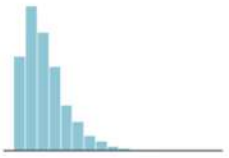
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91 Which histogram shows a set of data that is approximately normally distributed?

(A) 

(B) 

(C) 

(D) 

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92 According to the Empirical Rule, approximately what percent of the data in a normal distribution fall within 2 standard deviations of the mean?

(A) 99.7% (B) 95% (C) 13.5% (D) 68%

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93 A set of data is normally distributed with mean 80 and standard deviation 4. Approximately what percent of the data lie between 72 and 88?

(A) 99.7% (B) 47.5% (C) 95% (D) 68%

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94 A set of data is normally distributed with mean 80 and standard deviation 4. Approximately what percent of the data are greater than 84?

(A) 16% (B) 34% (C) 32% (D) 13.5%

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95 Which statement is true for data that are skewed to the left?

(A) The Empirical Rule applies exactly, with 68% within one standard deviation.

(B) The Empirical Rule cannot be used because the data are not approximately normal.

(C) The mean, median, and mode are all equal.

(D) The data are symmetric about the mean.

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Q	LEARNING OUTCOME	REVEAL (ENGLISH)	PAGE
Q21	Solve quadratic equations by completing the square	Example 5 Example 7	35 36

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1 **Solve $x^2 + 18x - 4 = 0$ by completing the square.**

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2 **Solve $4x^2 - 12x - 27 = 0$ by completing the square.**

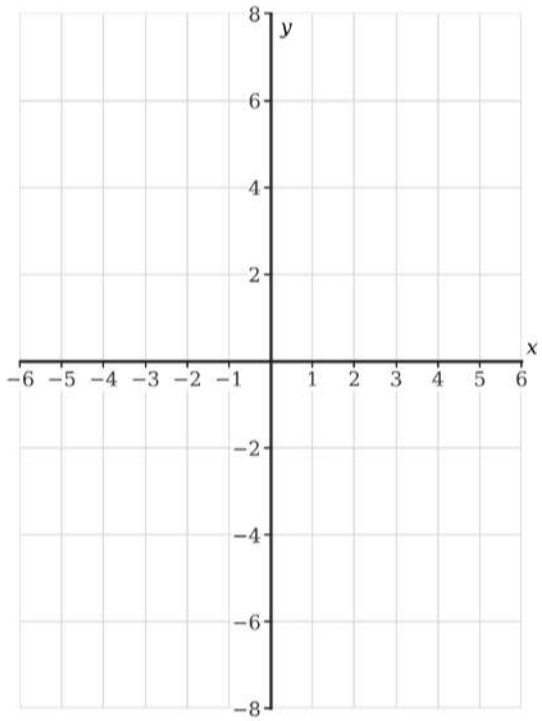
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Q	LEARNING OUTCOME	REVEAL (ENGLISH)	PAGE
Q22	Solve quadratic inequalities in one variable	Example 3 Example 4	53

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3 **Solve $x^2 + x - 6 < 0$ by graphing.**

Sketch the related function on the grid.



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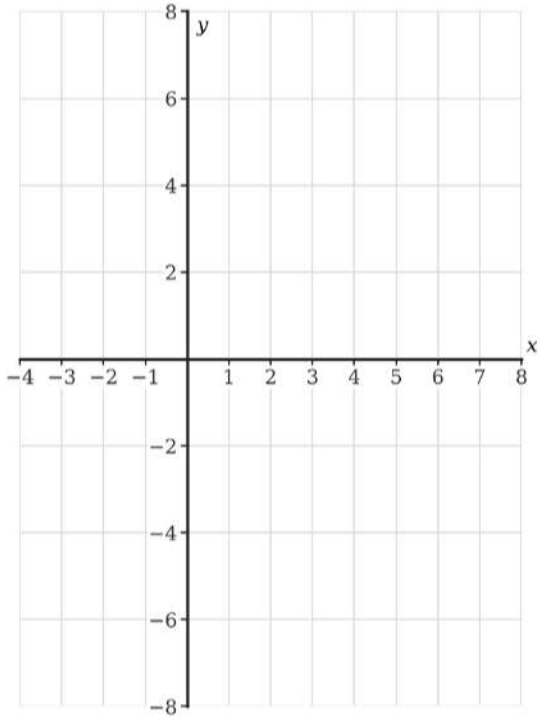
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4 **Solve $x^2 - 3x - 4 \geq 0$ by graphing.**

Sketch the related function on the grid.



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Q	LEARNING OUTCOME	REVEAL (ENGLISH)	PAGE
Q23	(a,b) Add, subtract, and multiply polynomials	(5,10,19-22) (36-39)	97 98

5 Book #5

Add or subtract.

5. $(6a^2 + 5a + 10) - (4a^2 + 6a + 12)$

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6 Book #10

10. $(-2f^2 - 3f - 5) + (-2f^2 - 3f + 8)$

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7 Book #19

Multiply.

19. $(x-y)(x^2+2xy+y^2)$

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8 Book #20

20. $(a+b)(a^3-3ab-b^2)$

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9 Book #21

21. $(x-y)(x+y)(2x+y)$

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10 Book #22

22. $(a+b)(2a+3b)(2x-y)$

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11 Book #36

Simplify.

36. $(2x - 2y)^3$

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12 Book #37

37. $(4n - 5)^3$

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13 Book #38

38. $(3z - 2)^3$

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14 Book #39

39. $\frac{1}{4}(16x - 12y) + \frac{1}{3}(9x + 3y)$

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Q	LEARNING OUTCOME	REVEAL (ENGLISH)	PAGE
Q24	Solve exponential equations	(21,22,24,25)	230

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Solve each equation.

15 Book #21

21. $8^{4x+2} = 64$

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16 Book #22

22. $5^{x-6} = 125$

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17 Book #24

24. $256^{b+2} = 4^{2-2b}$

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18 Book #25

25. $9^{3c+1} = 27^{3c-1}$

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Q	LEARNING OUTCOME	REVEAL (ENGLISH)	PAGE
Q25	Find probabilities for normal distributions and find data values given probabilities	Example 8 Example 14	400 402

19 **INTERNET TRAFFIC** The number of daily hits to a local news Web site is normally distributed with $\mu = 98{,}452$ hits and $\sigma = 10{,}325$ hits. Find the probability that the Web site will get at least 100,000 hits on a given day, $P(X > 100{,}000)$.

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20 Book #14a **TESTING** The scores on a test administered to prospective employees are normally distributed with a mean of 100 and a standard deviation of 12.3.

14a. What percent of the scores are between 70 and 80?

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21 Book #14b **TESTING** The scores on a test administered to prospective employees are normally distributed with a mean of 100 and a standard deviation of 12.3.

14b. What percent of the scores are over 115?

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22

Book #14c

TESTING The scores on a test administered to prospective employees are normally distributed with a mean of 100 and a standard deviation of 12.3.

14c. If 75 people take the test, how many would you expect to score lower than 75?

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