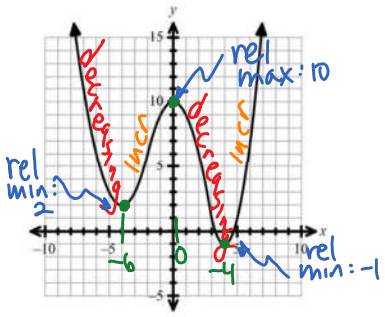
H, J

51. Based on the function graphed below, which statements are true? Select all that apply



~~F.~~ The function is always decreasing over the interval $(-\infty, \infty)$.

~~G.~~ The function is always increasing over the interval $(-4, 4)$.

H. The function is always increasing over the interval $(-4, 0)$.

~~I.~~ The function has a relative minimum value of 0.

J. The function has a relative minimum value of -1.

C

52. Let $f(x) = -6(x-7)^2$ and $g(x) = 4(x-5)^2$. Which of the following is equivalent to $f(x) - g(x)$?

Subtract

$-6(x-7)^2 - (4(x-5)^2)$

A. $-10x^2 + 394$

B. $-10x^2 + 44x - 194$

C. $-10x^2 + 124x - 394$

D. $100x^2 + 440x + 484$

$\rightarrow -6(x-7)(x-7) - (4(x-5)(x-5))$

$\rightarrow -6(x^2 - 7x - 7x + 49) - 4(x^2 - 5x - 5x + 25)$

$\rightarrow -6x^2 + 84x - 294 - 4x^2 + 40x - 100$

$\rightarrow -10x^2 + 124x - 394$

A

53. Multiply: $(2x^2 + 4x - 5)(-x^2 + 3x + 6)$

A. $-2x^4 + 2x^3 + 29x^2 + 9x - 30$

B. $2x^4 + 10x^3 + 19x^2 + 9x - 30$

C. $-2x^4 + 9x^2 + 21x - 30$

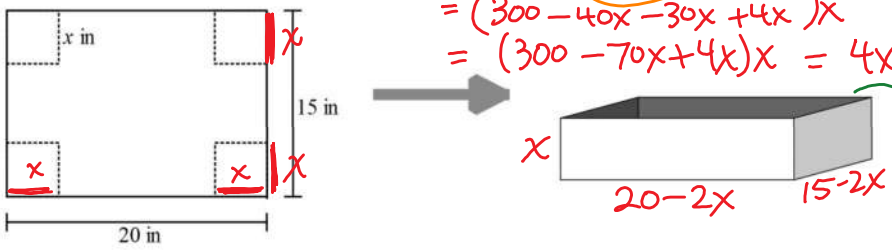
D. $-2x^4 + 24x^2 - 30$

	$-x^2$	$3x$	$+6$
$2x^2$	$-2x^4$	$6x^3$	$12x^2$
$4x$	$-4x^3$	$12x^2$	$24x$
-5	$5x^2$	$-15x$	-30

$-2x^4 + 2x^3 + 29x^2 + 9x - 30$

B **54.** A manufacturer is going to package their product in an open rectangular box made from a single flat piece of cardboard. The box will be created by cutting a square out from each corner of the rectangle and folding the flaps up to create a box. The original rectangular piece of cardboard is 20 *inches* long and 15 *inches* wide. Write a function that represents the volume of the box.

$V = l \cdot w \cdot h = (20-2x)(15-2x)x$
$= (300 - 40x - 30x + 4x)x$
$= (300 - 70x + 4x)x = 4x^2 - 70x^2 + 300x$



A. $V(x) = x^3 - 35x^2 + 300x$
B. $V(x) = 4x^3 - 70x^2 + 300x$
C. $V(x) = x^2 - 35x + 300$
D. $V(x) = 4x^2 - 70x + 300$

C **55.** Factor the following using imaginary numbers: $9x^2 + 49$ → "diff of squares" $9x^2 - (-49)$

A. $(3x - 7i)^2$
C. $(3x + 7i)(3x - 7i)$
B. $(\sqrt{3}x + 7i)(\sqrt{3}x - 7i)$
D. $(3x + 7i)^2$

$(3x + 7i)(3x - 7i)$

C **56.** Factor: $125x^3 - 343$ $a = 5x$ $b = 7$ diff of cubes: $a^3 - b^3 = (a-b)(a^2 + ab + b^2)$

A. $(5x - 7)(5x^2 + 35x + 7)$
C. $(5x - 7)(25x^2 + 35x + 49)$
B. $(5x - 7)(5x^2 + 35x - 7)$
D. $(5x - 7)(25x^2 - 35x - 49)$

$(5x - 7)((5x)^2 + 5x(7) + (7)^2)$
$\rightarrow (5x - 7)(25x^2 + 35x + 49)$

Released 7/30/21

A

57. If $a^3 - b^3 = (a - b)(a^2 + ab + b^2)$, then which expression is equivalent to $125x^6 - 27y^{12}$?

$\sqrt[3]{125x^6} = 5x^2$ $\quad \sqrt[3]{27y^{12}} = 3y^4$

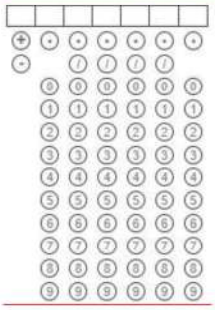
A. $(5x^2 - 3y^4)((5x^2)^2 + (5x^2)(3y^4) + (3y^4)^2)$

B. $(5x - 3y)(5x^4 + (5x^2)(3y^4) + 3y^4)$

C. $(125x^2 - 27y^4)((125x^2)^2 + (125x^2)(27y^4) + (27y^4)^2)$

D. $(125x - 27)(125x^4 + (125x^2)(27y^4) + 27y^4)$

58. What is the remainder in the division $(6x^3 - x^2 + 4x - 9) \div (2x - 3)$? Bubble your answer in the grid provided below.



59. Find the quotient of $(3x^3 - 44x + 8) \div (x - 4)$?

A. $3x^2 - 12x + 4$

B. $3x^2 - 12x + 4 + \frac{-8}{x-4}$

C. $3x^2 - 32 + \frac{-120}{x-4}$

D. $3x^2 + 12x + 4 + \frac{24}{x-4}$

Released 7/30/21

Algebra 2 Honors Semester 1
Instructional Materials 2021-22 Answers

Topic 1 Linear Functions & Systems			Topic 10 Matrices		
1.	C	HSF.IF.B.5	**13.**	D	HSN.VM.C.7(+)
2.	D	HSF.IF.B.5	**14.**	A	HSN.VM.C.8(+)
3.	A	HSF.IF.C.7b	**15.**	B	HSN.VM.C.12(+)
4.	C	HSF.IF.B.5	**16.**	−2	HSN.VM.C.8(+)
5.	B	HSF.LE.A.2 HSF.IF.C.7b	**17.**	D	HSN.VM.C.8(+)
6.	A	HSF.BF.B.3	**18.**	F, H, I, J	HSN.VM.C.9(+)
7.	K, H	HSF.IF.B.4	**19.**	C	HSN.VM.C.12(+)
8.	B	HSF.IF.B.6	**20.**	C	HSN.VM.C.10(+)
9.	A	HSA.REI.D.11	**21.**	−99	HSN.VM.10(+)
10.	B	HSA.REI.D.11	**22.**	A	HSN.VM.10(+)
11.	C	HSA.REI.C.6	**23.**	C	HSN.VM.10(+)
12.	122.75	HSA.REI.C.6	**24.**	C	HSN.VM.C.12(+)
			25.	D	HSA.REI.C.9
			26.	F, J	HSA.REI.C.9
			27.	B	HSA.REI.C.9

Released 7/30/21

Algebra 2 Honors Semester 1
Instructional Materials 2021-22 Answers

Topic 2 Quadratic Functions & Equations			Topic 3 Polynomial Functions		
28.	B	HSF.IF.B.4	**49.**	A	HSF.IF.B.4
29.	D	HSF.IF.B.4	**50.**	B	HSF.IF.B.4
30.	C	HSA.CED.A.2	**51.**	H, J	HSF.IF.B.4
31.	H, I, L, M	HSF.IF.B.4	**52.**	C	HSA.APR.A.1
32.	C	HSF.BF.B.3	**53.**	A	HSA.APR.A.1
33.	B	HSA.CED.A.2	**54.**	B	HSF.BF.A.1.b
34.	A	HSA.CED.A.2	**55.**	C	HSA.SSE.A.2 HSN.CN.C.8
35.	A	HSF.IF.B.4	**56.**	C	HSA.SSE.A.2
36.	D	HSA.CED.A.2	**57.**	A	HSA.APR.C.4
37.	B	HSN.CN.A.2	**58.**	15	HSA.APR.B.2
38.	D	HSN.CN.A.2	**59.**	D	HSA.APR.D.6
39.	D	HSN.CN.A.3(+)	**60.**	B	HSA.APR.B.2 HSF.IF.B.4
40.	B	HSA.SSE.A.3b	**61.**	C	HSA.APR.B.3 HSF.IF.C.7.c
41.	−14	HSA.REI.B.4a	**62.**	C	HSN.CN.C.7 HSA.APR.B.3
42.	C	HSA.REI.B.4b	**63.**	D	HSF.IF.C.7
43.	B	HSA.REI.B.4b HSN.CN.C.7	**64.**	B	HSN.CN.C.8(+) HSN.CN.C.9(+) HSA.APR.B.2 HSA.APR.B.3
44.	C	HSA.CED.A.2 HSN.CN.C.7	**65.**	A	HSN.CN.C.8(+) HSN.CN.C.9(+) HSA.APR.B.2 HSA.APR.B.3
45.	D	HSA.CED.A.2 HSA.REI.B.4	**66.**	C	HSN.CN.C.9(+)
46.	A	HSA.RE.IC.7	**67.**	D	HSF.BF.B.3
47.	52.5	HSA.REI.C.7 HSA.REI.D.11	**68.**	D	HSF.IF.B.4 HSF.BF.B.3
48.	B	HSA.REI.D.11 HSA.REI.D.12			

Released 7/30/21