

C 44. The function  $f(x)$  is graphed below. What are the solutions to  $f(x) = 0$ ?

~~A.~~  $x = -\frac{25}{4}$   
~~B.~~  $x = 3, -4$   
**C.**  $x = 3 \pm 4i$   
~~D.~~  $x = \pm 7i$

x	y
-1	-8
1	-5
3	-4
5	-5
7	-8

STATS OR  $a(x-h)^2 + k = y$   
 $a(1-3)^2 + k = -4$   
 $a(-2)^2 + k = -5$   
 $4a = -1$   
 $a = -\frac{1}{4}$

$-\frac{1}{4}(x-3)^2 - 4 = y$  (Set  $y=0$ )  
 $-\frac{1}{4}(x-3)^2 - 4 = 0$   
 $-\frac{1}{4}(x-3)^2 = 4$   
 $(x-3)^2 = -16$   
 $\sqrt{(x-3)^2} = \pm\sqrt{-16}$   
 $x-3 = \pm 4i$   
 $+3 \quad +3$   
 $x = 3 \pm 4i$

Quad Reg  $\rightarrow -0.25x^2 + 1.5x - 6.25$   
 quad formula or EQVA  $\rightarrow$  Poly Deg 2

D 45. Given the diagram below, approximate to the nearest foot how many feet of walking distance a person saves by cutting across the lawn instead of walking on the sidewalk.

$a^2 + b^2 = c^2$   
 $(x+12)^2 + x^2 = 60^2$   
 $(x+12)(x+12) + x^2 = 60^2$   
 $x^2 + 12x + 12x + 144 + x^2 = 3600$   
 $(2x^2 + 24x - 3456 = 0) \div 2$   
 $x^2 + 12x - 1728 = 0$   
 $x = 36$  (GC)  ~~$x = 36, -48$~~

$36 + 12 + 36 = 84$   
 $84 - 60 = 24$   
 Save 24 feet

A. 60 feet  
 B. 48 feet  
 C. 36 feet  
**D.** 24 feet

A 46. What are the x-coordinates of the points of intersection given the system below?

Substitution...  
 $\begin{cases} x^2 + 6x + 5y + 16 = 0 \\ 2x + y = -3 \end{cases}$   
 $y = -3 - 2x$  (isolate)

$x^2 + 6x + 5(-3 - 2x) + 16 = 0$   
 $x^2 + 6x - 15 - 10x + 16 = 0$   
 $x^2 - 4x + 1 = 0$

**A.**  $x = 2 + \sqrt{3}, x = 2 - \sqrt{3}$   
 B.  $x = 2 + i\sqrt{15}, x = 2 - i\sqrt{15}$   
 C.  $x = 4 + 2\sqrt{3}, x = 4 - 2\sqrt{3}$   
 D.  $x = -8 + \sqrt{33}, x = -8 - \sqrt{33}$

$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-(-4) \pm \sqrt{(4)^2 - 4(1)(1)}}{2(1)} = \frac{4 \pm \sqrt{16-4}}{2}$   
 $= \frac{4 \pm \sqrt{12}}{2} = \frac{4 \pm 2\sqrt{3}}{2} = 2 \pm \sqrt{3}$

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- 525 47. Two water balloons are launched in an experiment. The height of each water balloon is modeled by the equation  $h = -16t^2 + v_0t + h_0$  where  $t$  is time in seconds,  $h$  is the height above the ground,  $h_0$  is the initial height, and  $v_0$  is the initial velocity. The first balloon is launched from a 15 foot high platform at an initial velocity of 50 ft/sec. The second balloon is launched from the ground with an initial velocity of 62 ft/sec. At what height will the balloons collide? Round your answer to the nearest tenth if necessary. ?

Bubble your answer in the grid provided below.

	5	2	.	5	
⊕	⊖	⊗	⊘	⊙	⊚
⊛	⊜	⊝	⊞	⊟	⊠
⊡	⊢	⊣	⊤	⊥	⊦
⊧	⊨	⊩	⊪	⊫	⊬
⊭	⊮	⊯	⊰	⊱	⊲
⊳	⊴	⊵	⊶	⊷	⊸
⊹	⊺	⊻	⊼	⊽	⊾
⊿	⊠	⊡	⊢	⊣	⊤
⊥	⊦	⊧	⊨	⊩	⊪
⊫	⊬	⊭	⊮	⊯	⊰
⊱	⊲	⊳	⊴	⊵	⊶
⊷	⊸	⊹	⊺	⊻	⊼
⊽	⊾	⊿	⊠	⊡	⊢
⊣	⊤	⊥	⊦	⊧	⊨
⊩	⊪	⊫	⊬	⊭	⊮
⊯	⊰	⊱	⊲	⊳	⊴
⊵	⊶	⊷	⊸	⊹	⊺
⊻	⊼	⊽	⊾	⊿	⊠

Intersect

1st balloon  
 $h = -16t^2 + v_0t + h_0$   
 $h = -16t^2 + 50t + 15$

2nd balloon  
 $h = -16t^2 + v_0t + h_0$  (ground)  
 $h = -16t^2 + 62t + 0$

$-16t^2 + 50t + 15 = -16t^2 + 62t + 0$

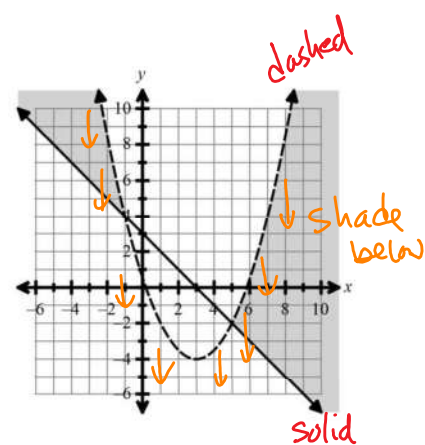
$15 = 12t$   
 $\frac{15}{12} = t$   
 $1.25 = t$  seconds

$h = -16(1.25)^2 + 62(1.25)$   
 $h = 52.5$

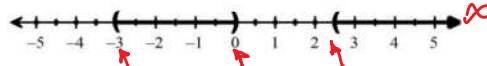
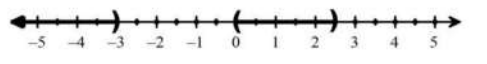
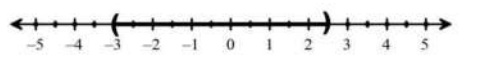
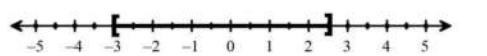
OR GC  
 Intersect  
 (1.25, 52.5)

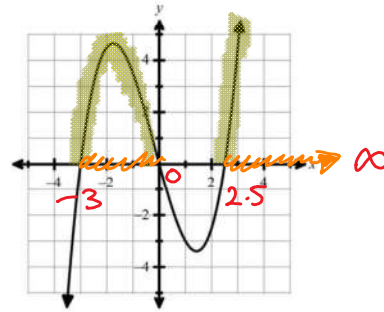
- B 48. Which of the following represents the system of inequalities below?

- A.  $\begin{cases} y > \frac{1}{2}(x-3)^2 - 4 \\ y \leq -x + 3 \end{cases}$
- B.  $\begin{cases} y < \frac{1}{2}(x-3)^2 - 4 \\ y \geq -x + 3 \end{cases}$
- C.  $\begin{cases} y \leq \frac{1}{2}(x-3)^2 - 4 \\ y > -x + 3 \end{cases}$
- D.  $\begin{cases} y \geq \frac{1}{2}(x-3)^2 - 4 \\ y < -x + 3 \end{cases}$

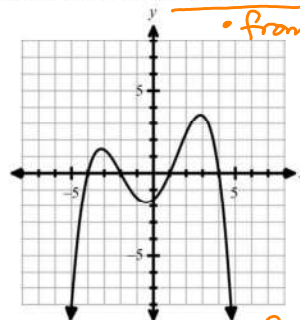


- A49. The function  $f(x) = \frac{1}{2}x^3 + \frac{1}{4}x^2 - \frac{15}{4}x$  is graphed below. Over which intervals of  $x$  is the graph positive?  
*• above the x-axis*

- A. 
- B. 
- C. 
- D. 



- B50. Which of the following functions has the same end behavior as the function below?



As  $x \rightarrow -\infty, y \rightarrow -\infty$

As  $x \rightarrow +\infty, y \rightarrow -\infty$

~~A.~~  $g(x) = -6x - 7$

**B.**  $g(x) = -|x + 3| - 5$

~~C.~~  $g(x) = x^2 - 4x + 5$

~~D.~~  $g(x) = x^3 + 2x$

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

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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.	D	HSA.APR.B.2
38.	D	HSN.CN.A.2	59.	D	HSA.APR.D.4
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.2 HSF.IF.C.7.a
41.	-14	HSA.REI.B.4a	62.	C	HSN.CN.C.7 HSA.APR.B.2
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			

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