

Algebra 2 Review Answers

#2 (White Sheet)

Part 1: No Calculator

1) $f(x) = x^2 - 2x$ $f(-5)$

$$\begin{aligned} &(-5)^2 - 2(-5) \\ &25 + 10 \\ &35 \end{aligned}$$

2) $y = (x-3)$ I used substitution

$$y + x = 5 \quad \text{to get } (4, 1)$$

$$(x-3) + x = 5$$

$$2x - 3 = 5$$

$$2x = 8$$

$$x = 4$$

$$y = 4 - 3$$

3) $y = mx + b$ (slope-intercept) $y = m(x-x_1) + y_1$ (point-slope)

using point-slope:

$$y = \frac{1}{2}(x-6) + 2$$

$$y = \frac{1}{2}x - 3 + 2$$

$$y = \frac{1}{2}x - 1 \quad \swarrow \text{(slope-intercept)}$$

4) YES b/c $-2x^2$

5) NO b/c $2x^3 \leftarrow$

6) YES b/c $-x(x+3) = -x^2 - 3x$

7) NO b/c $\frac{1}{x^2} \leftarrow$ not in denom.

8) $g(x) = (x-2)(3x+b)$

$$g(x) = 3x^2 - 12$$

~~opens~~ opens: UP
vertex: min

$$9. 2x^2 + 16x = 0$$

$$2x(x+8) = 0$$

$$2x = 0 \quad x + 8 = 0$$

$$x = 0 \quad x = -8$$

$$10. x^2 - 2x - 15 = 0$$

$$(x-5)(x+3) = 0$$

$$x = 5 \quad x = -3$$

$$11. 2x^2 + 9x + 10 = 0$$

$$\left(\frac{20}{4} \right)$$

$$x+2$$

$$+5 \quad 5x+10$$

$$(2x+5)(x+2) = 0$$

$$2x+5=0 \quad x+2=0$$

$$x = -5/2 \quad x = -2$$

$$12. x^2 - 5 = 76$$

$$x^2 = 81$$

$$x = \pm 9$$

$$13. \sqrt{(x-2)^2} = \sqrt{9}$$

$$x-2 = \pm 3$$

$$x-2=3 \quad x-2=-3$$

$$x=5 \quad x=-1$$

$$14. y = (x+3)^2 + 2 \quad \text{Vertex: } (-3, 2)$$

up

$$15. y = 2x^2 - 4x + 1$$

$$-b \pm \sqrt{b^2 - 4ac} = \frac{-(-4) \pm \sqrt{(-4)^2 - 4(2)(1)}}{2(2)}$$

axis of symmetry: $x = 1$
Vertex: $(1, -1)$

$$y = 2(1)^2 - 4(1) + 1$$

$$y = 2 - 4 + 1 \quad y = -1$$

Part 2: Calculator

$$1. d(x) = \frac{11}{10}x + \frac{1}{19}x^2$$

$x = \text{speed}$

$d(x) = \text{distance}$

Use your calculator! $d(x) = 156.1$ feet
Plug in 40 for x !

2. NOPE! :)

$$3. 3x^2 = 81$$

$$4. 6x^2 + 8 = 52$$

$$x^2 = 27$$

$$6x^2 = 44$$

$$x = \pm\sqrt{27}$$

$$x^2 = \frac{44}{6}$$

$$x = \pm 3\sqrt{3}$$

$$x = \pm\sqrt{\frac{44}{6}}$$

$$5. x^2 - 9 = 0$$

You can use quadratic formula or algebra.

$$x^2 = 9$$

$$x = \pm 3$$

$$6. x^2 - 2x = -8$$

$$-b \pm \sqrt{b^2 - 4ac}$$

$$x^2 - 2x + 8 = 0$$

$$a = 1$$

$$2a$$

$$2 \pm \sqrt{4 - 4(1)(8)}$$

$$b = -2$$

$$c = 8$$

$$2(1)$$

$$2 \pm \sqrt{4 - 32}$$

on your calculator

$$2$$

set mode to a+bi

$$2 \pm \sqrt{-28}$$

$$2$$

$$2 \pm 2i\sqrt{7}$$

$$2$$

$$1 + 2.6i$$

$$7. 2x^2 - 6x - 9 = 0 = \frac{6 \pm \sqrt{36 - 4(2)(-9)}}{4}$$

$$a = 2$$

$$b = -6$$

$$c = -9$$

$$= 8.6$$

$$8. x^2 + 6x + 6 = 0$$

$$b^2 - 4ac$$

$$a = 1$$

$$36 - 4(1)(6)$$

Neg = no real

$$b = 6$$

$$36 - 24$$

Pos > 2 real

$$c = 6$$

$$12$$

$c = 1$ real

= 2 real solutions

$$9. x^2 + 20x + 100$$

$$10. x^2 - 8x + 16$$

$$\left(\frac{20}{2}\right)^2 \rightarrow$$

$$\left(\frac{-8}{2}\right)^2 \rightarrow$$

$$11. x^2 - 8x = 3$$

$$12. -10 = x^2 - 8x + 2$$

$$x^2 - 8x + 16 = 3 + 16$$

$$-12 = x^2 - 8x + 16$$

$$(x - 4)^2 = 19$$

$$-12 = (x - 4)^2$$

$$x - 4 = \pm \sqrt{19}$$

$$\pm \sqrt{-12} = x - 4$$

$$x = 4 \pm \sqrt{19}$$

$$x = 4 \pm 2i\sqrt{3}$$

$$13. (2 + 5i)(2 - (11 - 4i))$$

$$14. (2 + 5i)^2$$

$$2 + 5i + -11 + 4i$$

$$(2 + 5i)(2 + 5i)$$

$$-9 + 9i$$

$$4 + 10i + 10i + 25i^2$$

$$4 + 20i + 25(-1)$$

$$4 - 25 + 20i$$

$$-21 + 20i$$

$$15. \text{Graph - Vertex } (5, 3)$$

$$y(x - 5)^2 + 3$$

\checkmark a point inside like $(5, 6)$

$$(5, 6)$$

$$y > (5 - 5)^2 + 3$$

$$6 > 0 + 3$$

$$6 > 3 \text{ TRUE}$$

$$(0, 0)$$

$$0 > 0 + 3$$

$$0 > 3 \text{ FALSE}$$

shade inside

16. $P = h^2 - 12h + 210$

$P = (h - 6)^2 + 174$ (Vertex form)

minimum/vertex (6, 174) (time, prod)

a. At 6 am the minimum production occurs.

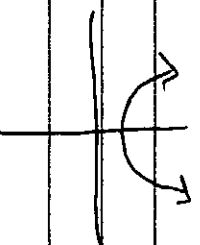
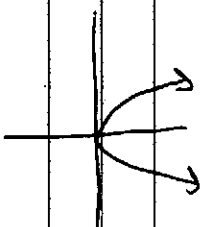
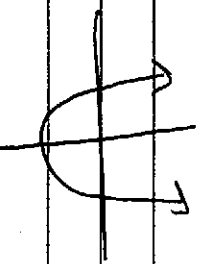
b. The minimum production is 174 megawatts

c. $P = h^2 - 12h + 210$

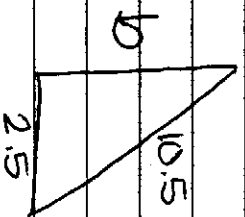
$P = 49 - 12(7) + 210$

$P = 175$ megawatts @ 7 am

17. 2 solutions 1 solution 0 solutions



18.



$$10.5^2 = 2.5^2 + b^2$$

$$10.5^2 - 2.5^2 = b^2$$

$$104 = b^2$$

$$10.2 = b$$

10.2 feet up on the wall

19. a) $y = -16x^2 + 20x + 3$

(vertex) =

b) max height is 9.25 feet (0.625, 9.25)

c) If took 9.25 s to reach the max

d) -21 feet?

e) so when $y=0$ $x=1.25$ that's the # of s to hit the ground. relative term used. formula

Formulas and Tech Notes

* Quadratic Formula $-b \pm \sqrt{b^2 - 4ac}$
 $2a$

(equation must be in standard $ax^2 + bx + c = 0$ form!)

* Vertex Form

$$y = a(x-h)^2 + k \quad (h, k) = \text{vertex}$$

(watch signs for x-coordinate)

* Quadratic Regression

→ STAT → EDIT

* Enter L_1, L_2 data

→ STAT → CALC → QUADREG

→ VARS → VARS → FUNCTION → Y, → ENTER

Be sure you pts are on $\frac{1}{4}$ zoom stat to fit data in window

* When asked to solve by factoring, or quadratic formula or to find # of solutions - MUST BE IN STANDARD FORM!

* If there is only an x^2 term with NO x term, usually you can solve with Algebra 1

$$\text{Ex. } 3x^2 + 9 = 27$$

$$3x^2 = 18$$

$$x^2 = 6$$

$$x = \pm \sqrt{6}$$

If there is an x term you can:

* Graph

→ Use Quad.

* Factor

formula

* Complete the \square