

Review of Unit 2 Test

Solve each equation by completing the square.

1) $x^2 - 8x + 15 = 0$
 $\{5, 3\}$

3) $n^2 + 20n - 19 = 2$
 $\{1, -21\}$

5) $0 = -6x^2 + 7x + 75$ $\left\{\frac{25}{6}, -3\right\}$

2) $k^2 - 10k - 24 = 0$
 $\{12, -2\}$

4) $x^2 + 12x + 27 = -8$
 $\{-5, -7\}$

6) $7n = -2 - n^2$ $\left\{\frac{-7 + \sqrt{41}}{2}, \frac{-7 - \sqrt{41}}{2}\right\}$

Simplify. Write the solution in standard form for complex numbers (a + bi)

7) $(-5 + 6i)(5 - 4i) = -25 + 30i + 20i - 24i^2$
 $-1 + 50i$

9) $(-2 + 7i)(2 + 5i)$
 $-39 + 4i$

11) $(-3i) - (5i)$
 $-8i$

8) $-5(-7 - 6i) + (6i)(-4 - 7i) = +35 + 30i - 24i - 42i^2$
 $77 + 6i$

10) $(2i)(-5 - 7i) + 8(-4i)$
 $14 - 42i$

12) $(-4i) + (6i)$
 $2i$

Solve each equation by factoring.

13) $(k + 5)(2k + 5) = 0$ $\left\{-5, -\frac{5}{2}\right\}$
 $k + 5 = 0$ or $2k + 5 = 0$
 $k = -5$ or $2k = -5$
 $k = -\frac{5}{2}$

15) $n^2 = 8n - 12$
 $\{2, 6\}$

17) $21x^2 + 70x = 56$ $\left\{\frac{2}{3}, -4\right\}$

14) $(n + 4)(n - 1) = 0$
 $\{-4, 1\}$

16) $2a^2 + 6a = 56$
 $\{4, -7\}$

18) $74x^2 - 139x + 25 = -x^2 + x$ $\left\{\frac{1}{5}, \frac{5}{3}\right\}$

Solve each equation with the quadratic formula.

19) $v^2 - 5v - 14 = 0$
 $\{7, -2\}$

21) $8x^2 = -6$ $\left\{\frac{i\sqrt{3}}{2}, -\frac{i\sqrt{3}}{2}\right\}$

23) $-7v^2 - 9v + 8 = v^2 - 4v$ $\left\{\frac{-5 - \sqrt{281}}{16}, \frac{-5 + \sqrt{281}}{16}\right\}$

20) $2m^2 - m - 10 = 0$
 $\{2.5, -2\}$

22) $6x^2 - 10x = -5$

$\frac{5}{6} \pm \frac{\sqrt{5}}{6}i$

24) $3n^2 + 4n + 9 = 9n^2 + 8n$ $\left\{\frac{-2 - \sqrt{58}}{6}, \frac{-2 + \sqrt{58}}{6}\right\}$

Solve each equation by taking square roots.

25) $p^2 - 6 = 24$
 $\{\sqrt{30}, -\sqrt{30}\}$

27) $9 - 2x^2 = -103$
 $\{2\sqrt{14}, -2\sqrt{14}\}$

26) $-5a^2 = -285$
 $\{\sqrt{57}, -\sqrt{57}\}$

28) $9m^2 + 10 = 892$
 $\{7\sqrt{2}, -7\sqrt{2}\}$

$$3(x^2 + 2x - 8) = 3(x+4)(x-2)$$

29) For the function: $f(x) = 3x^2 + 6x - 24$, provide the following information, graph, and label as noted.

Factor the quadratic in order to get the x-intercepts.

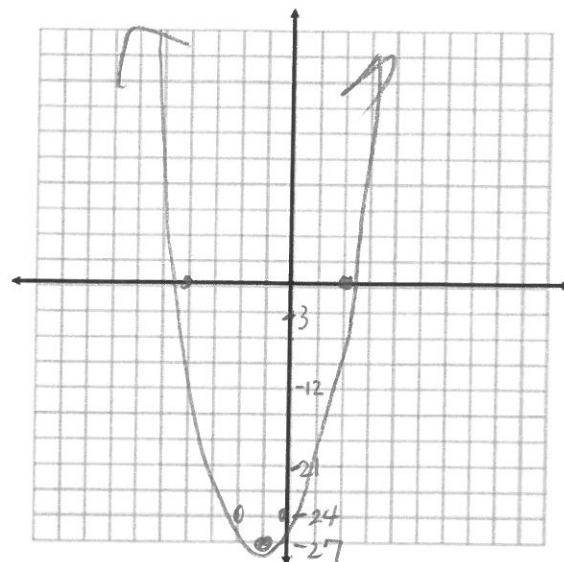
a) X-intercepts: $(-4, 0) (2, 0)$

b) Line of Symmetry: $x = \frac{-6}{6} = -1$

c) Vertex: $(-1, -27)$

d) Y-intercept: $(0, -24)$

e) Max / Min and Value: -27



30) For the function: $f(x) = -2(x+1)^2 - 3$, provide the following information, graph, and label as noted.

a) Line of Symmetry: $x = -1$

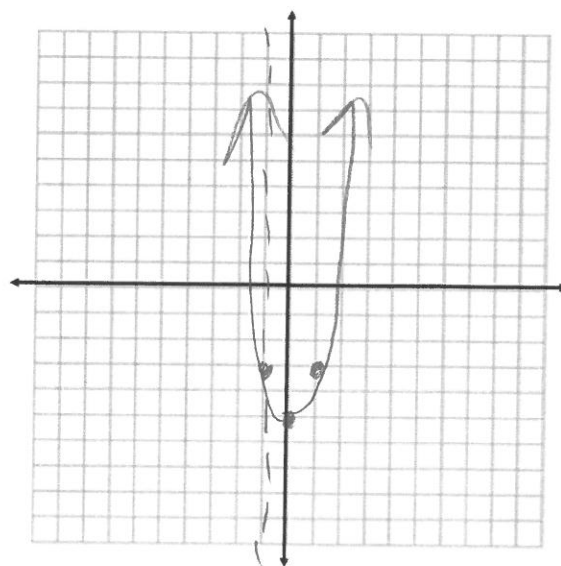
b) Vertex: $(-1, -3)$

c) Y-intercept: $(0, -5)$

d) Other points: $(1, -3)$

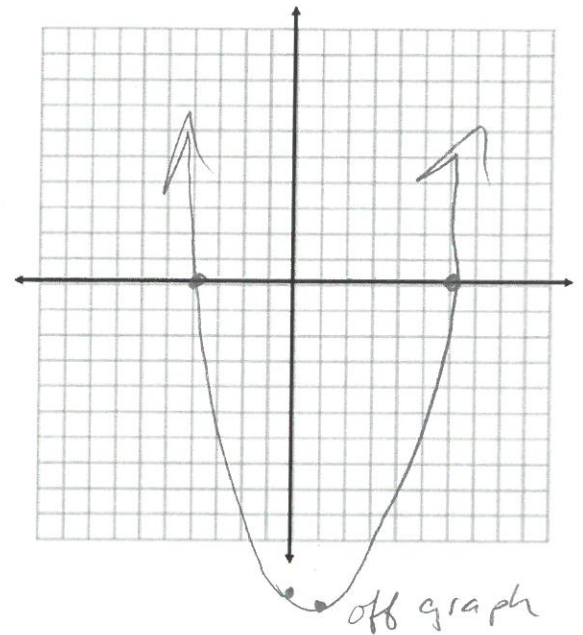
e) Max / Min Value: -3

f) Stretched compressed, or neither (circle one)



31) For the function: $f(x) = \frac{1}{2}(x+4)(x-6)$, provide the following information, graph, and label as noted.

- a) X-intercepts: $(-4, 0)$ $(6, 0)$
- b) Line of Symmetry: $x = \frac{6 + (-4)}{2} = 1$
- c) Vertex: $(1, -\frac{25}{2})$ or $(1, -12.5)$
- d) Y-intercept: $(0, -12)$
- e) Max / Min Value: -12
- f) Stretched, compressed, or neither (circle one)



32) Solve the following system:

$$\begin{cases} y = 3x + 1 \\ y = 4 - x^2 \end{cases}$$

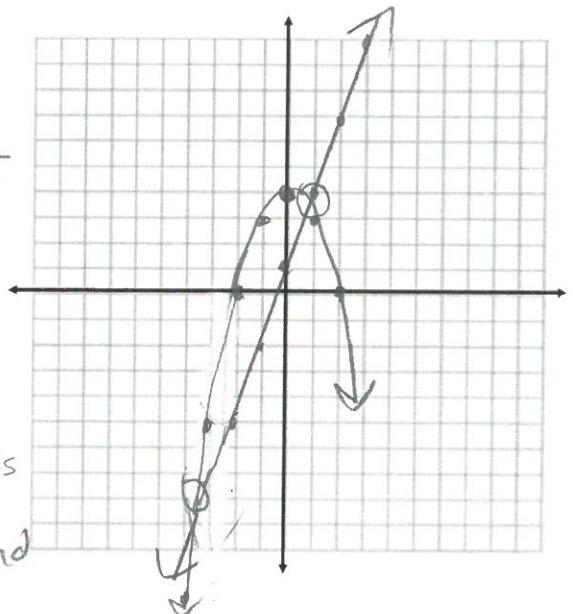
a. Graphically: $4 - x^2 = 3x + 1$
 $-4 + x^2 + x^2 - 4$
 $0 = x^2 + 3x - 3$

b. Algebraically: $x = \frac{-3 \pm \sqrt{9 - 4(1)(-3)}}{2}$

$(.7913, 3.37)$
 $(-3.79, -10.37)$

the problem on test is much easier.

put in calc + get decimals then put into eq to find y.

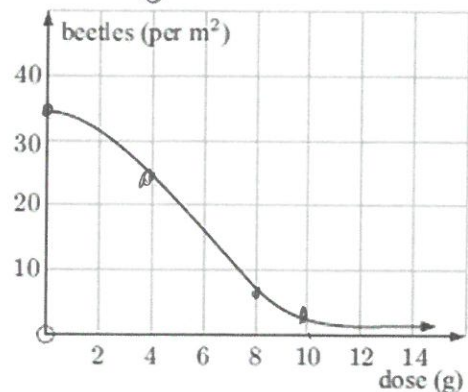


33) The numbers of surviving beetles per m^2 of lawn after various doses of poison, are shown in the graph alongside.

- a Estimate the rate of beetle decrease when:
- the dose increases from 0 to 10 g
 - the dose increases from 4 to 8 g.
- b Describe the effect on the rate of beetle decline as the dose goes from 0 to 14 g.

a i) $\frac{35-2}{0-10} = \frac{33}{-10} = -3.3 \text{ beetles/g}$

ii) $\frac{25-5}{4-8} = \frac{20}{-4} = -5 \text{ beetles/g}$



b) between 2g + 10g of poison are the most effective. More poison has little more effect.