Chapter 4 Review

Date:

1. Fill in the blanks for each of the following quadratic functions.

a) $y=(x+2)^2-3$ vertex _____ direction of opening _____

b) $y=-(x-1)^2-3$ axis of symmetry _____ y-intercept _____

c) $y=\frac{2}{3}(x-5)^2+6$ min/max value _____ shape compared to
(circle appropriate type) graph of $y=x^2$ _____

d) $y=-x^2-1$ vertex _____ axis of symmetry_____

e) $y=-2(x-2)^2-5$ direction of opening _____ min/max point _____
(circle appropriate type)

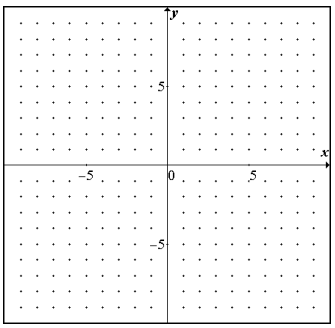
f) $y=-(x+2)^2$ y-intercept _____ vertex _____

g) $y=4-x^2$ direction of opening _____ min/max point _____
(circle appropriate type)

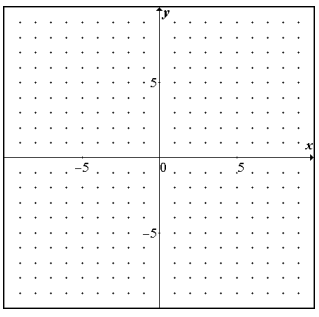
h) $y=x^2-12x$ x-intercepts (if any) _____ vertex _____

2. Draw accurate graphs of the following functions. *Clearly* indicate the 5 key points used.

a) $y=3(x+1)^2-5$



b) $y=-2x^2+4x-3$



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3. Determine the equations of the following parabolas for the given information.
   a) vertex $(0,0)$ passing through the point $(2,1)$
   b) vertex $(3,-\frac{1}{2})$ and y-intercept 4
   c) axis of symmetry, with a maximum value of 3, with the same shape as $y = x^2$
   d) minimum point of $(-1,-9)$ with x-intercepts of $2,-4$

4. A rectangular parking lot is to be fenced on three sides leaving the fourth side open to the street. If there is 800 metres of fencing available, determine the dimensions that would produce the maximum area.

5. Solve each of the following:
   a) $3x^2 - 8x + 2 = 0$ *b*) $(3x-5)(x-2) = 6$ *c*) $5x^2 - x - 4 = 0$
   d) $x^2 - 5x = 6$ *e*) $2x(x+7) = 5 - 2x$ *f*) $3(x-1)^2 = 2x$

6. The sum of a number and its square is 90. What is the number? Write a full solution.

7. Proper solutions would be required for each of the following:
   a) Two numbers differ by 6. If their product is a minimum, determine these numbers.
   b) A football is kicked so that its height after t seconds is given by, $h = 28t - 5t^2$. Determine the maximum height of the ball, and the length of time it is in the air.

8. A rectangular lot is 15 m longer than it is wide. If the area is 1000 m^2, determine the length.

9. Find the x and y intercepts of the graph of $y = 3x^2 - 8x + 4$

Answers

3a) $y = \frac{1}{4}x^2$ b) $y = \frac{1}{2}(x-3)^2 - \frac{1}{2}$ c) $y = -(x+2)^2 + 3$ d) $y = (x+1)^2 - 9$

4) 200 by 400 m

5a) $x = \frac{4 \pm \sqrt{10}}{3}$ b) $x = \frac{11 \pm \sqrt{73}}{6}$ c) $x = \frac{-4}{5}$ or $x = -1$ d) $x = 6$ or $x = -1$

e) $x = \frac{-8 \pm \sqrt{74}}{2}$ f) $x = \frac{4 \pm \sqrt{7}}{3}$ 6) -10 or 9

7a) ± 3 b) $h = -5\left(t - \frac{14}{5}\right)^2 + \frac{196}{5}$; max height is 39.2 m

8) 25 by 40 m 9) $x = \frac{2}{3}$ or $x = 2; y = 4$