

1. If  $f(x) = \log_7(x-11) + 15$ , find  $f^{-1}(x)$ .

$$x = \log_7(y-11) + 15$$

$$x - 15 = \log_7(y-11)$$

$$7^{x-15} = y-11$$

$$y = 7^{x-15} + 11$$

2. Solve:  $3x + y = -3$

$$-3(x + 4y = 10)$$

$$-3x - 12y = -30$$

$$\underline{3x + y = -3}$$

$$-11y = -33$$

$$y = 3$$

$$x + 4(3) = 10$$

$$x = -2$$

3. Find the equation of the line with slope of  $-2/5$  passing through  $(-5, 4)$

$$y = -\frac{2}{5}x + b$$

$$4 = -\frac{2}{5}(-5) + b$$

$$4 = 2 + b$$

$$2 = b$$

$$y = -\frac{2}{5}x + 2$$

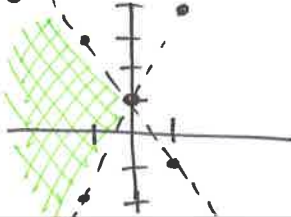
4. Factor:  $2x^2 + 13x + 15$

$$(2x + 3)(x + 5)$$

5. Graph:  $-2x - y > -1$   
 $y - 3x > 1$

$$y > 3x + 1$$

$$y < -2x + 1$$



6. Solve:  $3x^2 + 7x = -3$

$$3x^2 + 7x + 3 = 0$$

$$x = \frac{-7 \pm \sqrt{49 - 36}}{6}$$

$$x = \frac{-7 \pm \sqrt{13}}{6}$$

7. Solve:  $\sqrt{3x+4} + 2 = x$

$$\sqrt{3x+4} = x-2$$

$$3x+4 = x^2 - 4x + 4$$

$$0 = x^2 - 7x$$

$$0 = x(x-7)$$

$$x \neq 0 \quad x = 7$$

8. Solve:  $x^4 - 5x^2 + 4 = 0$

$$(x^2 - 1)(x^2 - 4) = 0$$

$$(x+1)(x-1)(x-2)(x+2) = 0$$

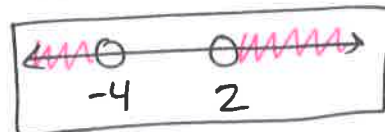
$$x = \pm 1 \quad x = \pm 2$$

9. Solve:  $2x^2 + 4x - 16 > 0$

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

$$(x+4)(x-2) > 0$$

$$x < -4 \quad x > 2$$



10. Find the vertex of  $y = 2x^2 - 20x + 18$ .

$$y - 18 + 25 = 2[x^2 - 10x + 25]$$

$$y + 7 = 2(x-5)^2$$

$$y = 2(x-5)^2 - 7$$

11. If  $f(x) = 2x^5$  and  $g(x) = 3x^2 - 11$  find  $g(f(x))$

$$g(f(x)) =$$

$$= 3(2x^5)^2 - 11$$

$$= 3[4x^{10}] - 11$$

$$= 12x^{10} - 11$$

12. Where do  $f(x) = 3x - 5$  and  $g(x) = x^2 - 4x + 7$  intersect? Solve algebraically.

$$x^2 - 4x + 7 = 3x - 5$$

$$x^2 - 7x + 12 = 0$$

$$(x-4)(x-3) = 0$$

$$x = 4$$

$$y = 7$$

$$x = 3$$

$$y = 4$$

13. Find the x and y intercepts of

$$y = 2x^2 + 3x + 1$$

x-int  $y=0$       y-int  $x=0$

$$0 = 2x^2 + 3x + 1$$

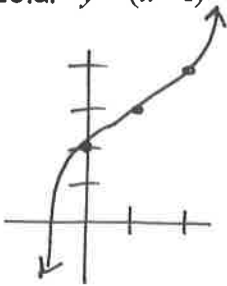
$$0 = (2x+1)(x+1)$$

$$x = -\frac{1}{2}, x = -1$$

$$y = 1$$

sketch:

16.a.  $y = (x-1)^3 + 3$



14. a parabola with a vertex at (3, 5) that passes through (-1, -2).

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

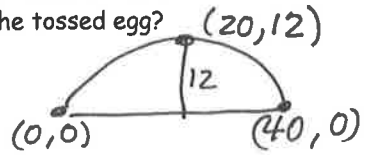
$$-2 = a(-1-3)^2 + 5$$

$$-2 = 16a + 5$$

$$-7 = 16a \rightarrow a = -\frac{7}{16}$$

$$y = -\frac{7}{16}(x-3)^2 + 5$$

15. At a recent egg-tossing contest, one student threw an egg 40 feet that reached a maximum height of 12 feet. What equation could be used to model the path of the tossed egg?



$$y = a(x-20)^2 + 12$$

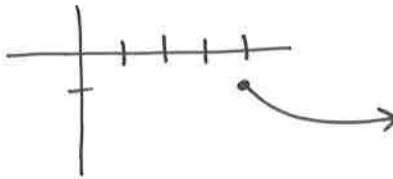
$$0 = a(40-20)^2 + 12$$

$$400a = -12$$

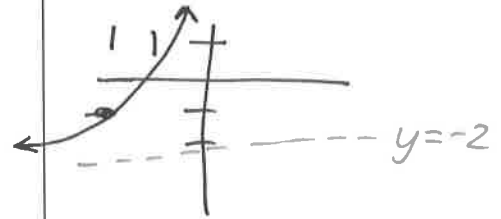
$$a = -\frac{12}{400}$$

$$y = -\frac{12}{400}(x-20)^2 + 12$$

b.  $y = -\sqrt{x-4} - 1$       (4, -1)



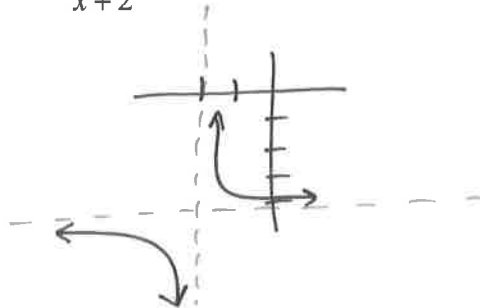
c.  $y = 3^{x+2} - 2$



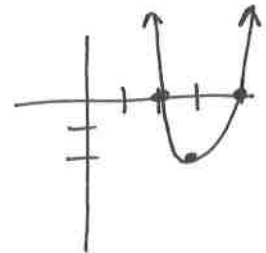
d.  $y = -\frac{1}{3}|x-3| + 1$       3, 1



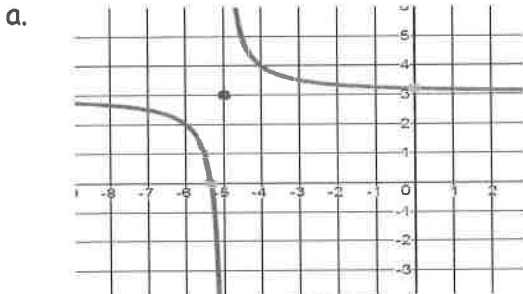
e.  $y = \frac{1}{x+2} - 4$       -2, -4



f.  $y = 2(x-3)^2 - 2$       (3, -2)



17. Write the equation of each graph below in graphing form. Assume  $a=1$ , unless a point is given.



$$y = \frac{1}{x+4} + 3$$

b.

$$y = a|x+2| - 3$$

$$0 = a|3+2| - 3$$

$$3 = 5a$$

$$\frac{3}{5} = a$$

$$y = \frac{3}{5}|x+2| - 3$$

