

corrects
4pts each

1. 5.1 Write the number in scientific notation:

a. 321,547.28
= 3.2154728×10^5

b. 0.000003214
= 3.214×10^{-6}

2. 5.1 Write the number in decimal form:

a. -9.775×10^{-6}
- 0.000009775

b. -9.775×10^6
- 9,775,000.

3. 5.2 Simplify the following. Assume that the variables in the exponents are all integers and that none of the variables are zero.

a. $\left(\frac{3z^{-3}}{y}\right)^2 \left(\frac{9y^{-3}}{z^{-6}}\right)^{-2}$
= $\left(\frac{3}{yz^3}\right)^2 \left(\frac{9z^6}{y^3}\right)^{-2}$
= $\left(\frac{3^2}{y^2(z^3)^2}\right) \left(\frac{9^{-2}(z^6)^{-2}}{(y^3)^{-2}}\right)$
= $\left(\frac{3^2}{y^2z^6}\right) \left(\frac{9^{-2}z^{-12}}{y^{-6}}\right)$
 $\frac{3^2 y^6}{9^2 y^2 z^6 z^{12}} = \boxed{\frac{y^4}{9z^{18}}}$

$\frac{3^2}{9^2} = \frac{3^2}{(3 \cdot 3)^2}$
= $\frac{3^2}{3^2 \cdot 3^2} = \frac{1}{3^2}$
= $\frac{1}{9}$

b. $\left(\frac{2x^3y^{-2}}{x^{-1}y^{-3}}\right)^{-5} = \left(\frac{2x^3x^1y^3}{y^2}\right)^{-5}$
= $(2x^4y^1)^{-5}$
= $2^{-5}x^{-20}y^{-5}$
= $\boxed{\frac{1}{32x^{20}y^5}}$
(2⁵, 3 fine, in place of 32)

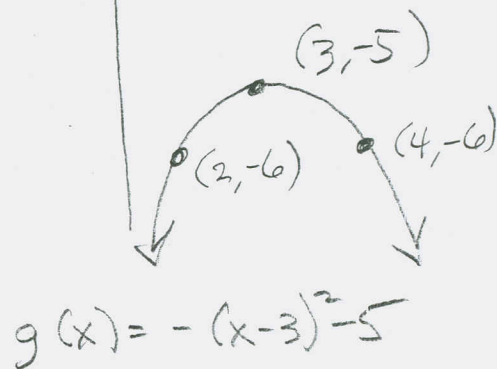
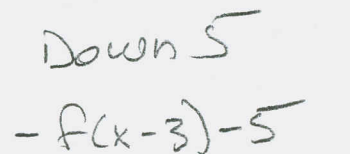
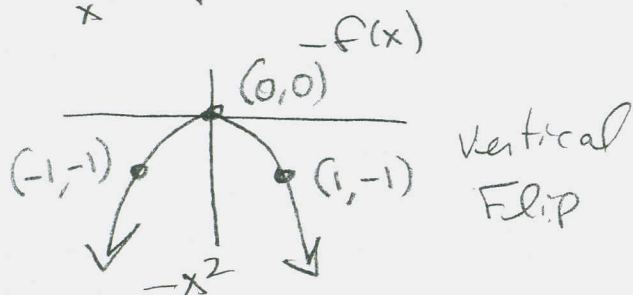
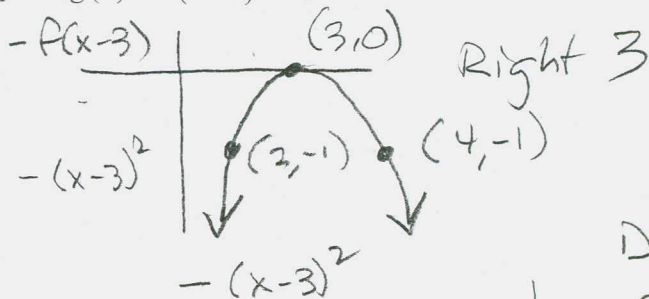
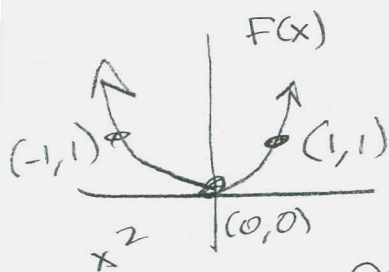
4. 5.3 Perform the indicated operations:

a. $(5x^2 - 3x + 7) - (-4x^3 + 2x^2 - 13x + 5)$
= $5x^2 - 3x + 7 + 4x^3 - 2x^2 + 13x - 5 = \boxed{4x^3 + 3x^2 + 10x + 2}$

b. $\left(\frac{3}{16}x^2 + \frac{5}{8}x - \frac{1}{2}\right) - \left(\frac{5}{8}x^2 - \frac{3}{16}x + \frac{1}{16}\right)$
= $\frac{3}{16}x^2 - \frac{5}{8}x^2 + \frac{5}{8}x + \frac{3}{16}x - \frac{1}{2} - \frac{1}{16}$
= $\frac{3}{16}x^2 - \frac{10}{16}x^2 + \frac{10}{16}x + \frac{3}{16}x - \frac{8}{16} - \frac{1}{16} = \boxed{-\frac{7}{16}x^2 + \frac{13}{16}x - \frac{9}{16}}$

$$x^2 \rightarrow -x^2 \rightarrow -(x-3)^2 \rightarrow -(x-3)^2 - 5$$

5. 5.3-and-before Sketch the graph of $g(x) = -(x-3)^2 - 5$



6. 5.4 Multiply:

a. $(3x+5)(4x+6)$

$$= 12x^2 + 18x + 20x + 30 = \boxed{12x^2 + 38x + 30}$$

b. $(x^2+2x+3)(x-2)$

$$= x^3 - 2x^2 + 2x^2 - 4x + 3x - 6 = \boxed{x^3 - x - 6}$$

c. $(3x+4)(3x-4)$ $(a-b)(a+b) = a^2 - b^2$

$$= \boxed{9x^2 - 16}$$

d. $(3x+4)^2$ $(a+b)^2 = a^2 + 2ab + b^2$

$$= \boxed{9x^2 + 24x + 16}$$

e. $(2x-3)+4$ $(a-b)^2 = a^2 - 2ab + b^2$

$$= (2x-3)^2 - 4^2 = 4x^2 - 12x + 9 - 16 = \boxed{4x^2 - 12x - 7}$$

7. 5.5 Factor out the greatest common factor:

a. $3x^3y - 21x^2y^3$

$$= \boxed{3x^2y(x - 7y^2)}$$

b. $4x(3x+5) + 6(3x+5)$

$$= \boxed{(3x+5)(4x+6)}$$

c. $7x(2x-3) - 2x+3$

$$= 7x(2x-3) - 1(2x-3) = \boxed{(2x-3)(7x-1)}$$