

**Not answers,
but where to
learn how.**

**** SHOW WORK **** (except on short-answer problems).

Algebraic problems without clear supporting work will receive **little or no credit**.

1. (Short answer problems.)

a) Find the x -value of the vertex of $y = kx^2 + 7 + 3dx$.

Find a , b , c and use $-b/(2a)$. P. 133-4.

" b " is the multiple ($3d$) of the variable (x). b is not always on the second term from the left.

b) What is the largest number of local maxima a polynomial of degree 4 can have?

"Maxima", not "extrema".

P.208, Fig. 6, upside down

c) $(x - h)^2 + (y - k)^2 = r^2$ is the equation of a circle.

How many parameters does it have?

Parameter p . 110-111. P.142, line 9

Problem	points	score
1	9	
2	8	
3	6	
4	8	
5	5	
6	12	
7	10	
8	6	
9	12	
10	12	
11	12	
total	100	

2. a) Solve for x : $x^{-1.7} = 50$

P.225, Example 11.

b) Let n be a positive integer and $k \neq 0$. Under what conditions on n and k does the equation " $x^n = k$ " have exactly two real-valued solutions?

P. 205, Theorem 4-2-1. Figures 1 and 2.

3. Solve algebraically: $\frac{x^4 x^5}{x^3} = 45$

Simplify as p.191-2. Solve $x^6 = 45$ as Example 4, p.206.

(Problem 2b dropped a hint. Because n is even, there are two solutions. Remember the "plus or minus".)

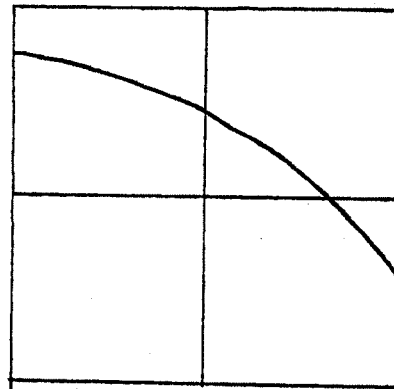
4. If Item B costs 35 percent more than Item A, how much less does Item A cost than Item B?

P.237, Example 15

5. Here is a graph of $y = f(x)$ in the window $[-100, 100]$ by $[-20, 20]$. Notice the window and its scale.

Use the graph to estimate $f^{-1}(-5)$.
[Reasonably close is good enough.]

$y = -5$. Find x .

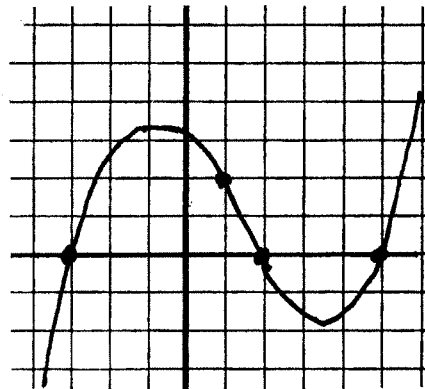


6. Here is a graph of a cubic polynomial $P(x)$. Grid lines are one unit apart. Algebraically find $P(x)$ with this graph that goes through the four emphasized points, including $(1, 2)$.

After you show your work below, fill in the answer here:

$P(x) =$

P.212, Example 11



7. Solve algebraically: $\sqrt{2x+7} = x-4$. [Show work or expect no credit.]

P.219, Example 1

(Remember to check the potential solutions.)

8. Solve algebraically for b in this equation: $a^2 + 4ab + 3b^2 + a = 14$.
[Once you have it correct, do not bother to “simplify” it.]

P.134, solving for unusual letters

9. Silver has density 10.5 grams per cubic centimeter. Gold has density 19.3 grams per cubic centimeter. If 15 cubic centimeters of an alloy (mixture) of gold and silver weigh 200 grams, how many cubic centimeters of the alloy are gold? [Algebraically SET UP one equation with one unknown that can be solved to find the answer, and then solve it.]

A mixture problem. Example 2, p.175. Example 3

10. Consider the graph of " $y = 1/x$." Let $0 < a < b$. The vertical lines $x = a$ and $x = b$ intersect the graph at two points. Find the point-slope form of the equation of the line through those two points. [Simplify the slope, but leave the overall equation in point-slope form.]

Section 3.1, Example 14, but with letters
(a replaces 2 and b replaces 3)

11. Suppose sales of the app iBozeman went up 120 percent over two years.

a) What was the average change per year over those two years?

P.241, Example 24, bottom, p. 242,
Example 25, B21, 32

b) If sales went up 55 percent the first year, how much did they go up the second?

Use word problem techniques.
4.4 B homework, B32