

COLLEGE ALGEBRA - MAT 140

FALL 2008 - REVIEW

I. Simplify and write using positive exponents: $\frac{4x^{-2}(yz)^{-1}}{2^3x^4y}$

II. Add. $(6x^5 + x^3 + x) + (5x^4 - x^3 + 3x^2)$

III. Expand (multiply) $(2x + 1)^3$

IV. Factor completely $x^4 + x^3 + x + 1$.

V. Find the least common denominator and simplify $\frac{4x}{x^2 - 4} - \frac{2}{x^2 + x - 6}$.

VI. Find the length and the mid point of the line segment given in the Figure 1.

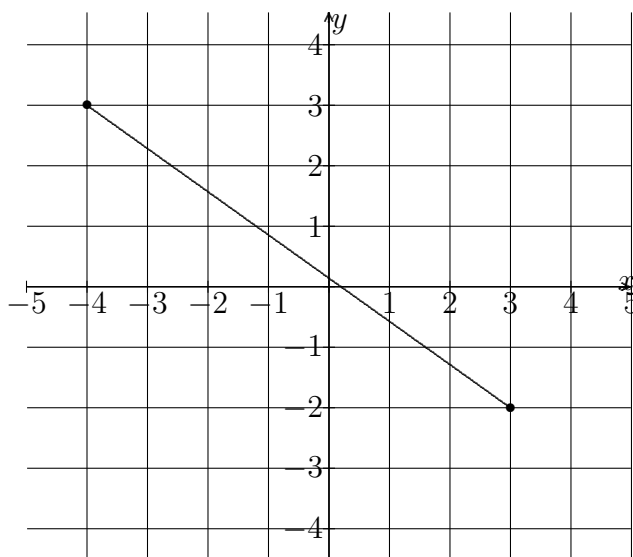


Figure 1:

VII. An open box is to be constructed from a square piece of sheet metal by removing a square of side 1 foot from each corner and turning up the edges. If the box is to hold 4 cubic feet, what should be the dimension of the sheet metal?

VIII. Use a graphing utility to approximate the real solutions, if any, of $x^4 - 5x^2 + 2x + 5 = 0$. Round your answers to two decimal places. Sketch your graph in the given grid.

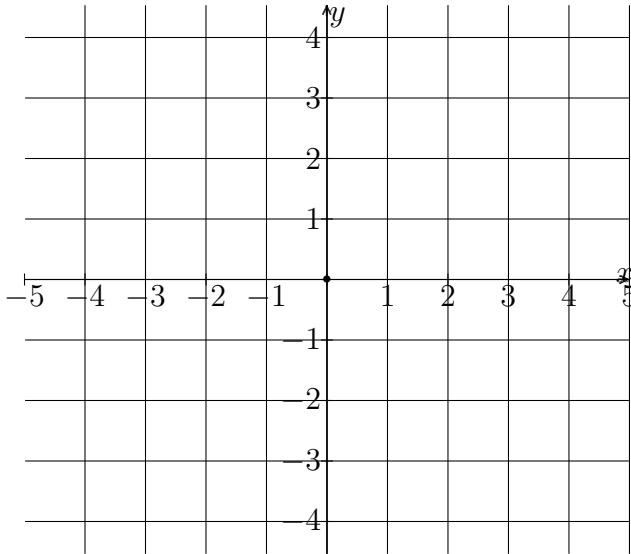


Figure 2:

IX. Find the real solutions of the following equations:

(i) $3x^4 - 2x^2 - 1 = 0$

(ii) $\sqrt{3x+7} + \sqrt{x+2} = 1$

X. Betsy, a recent retiree, requires \$6000 per year in extra income. She has \$50,000 to invest and can invest in B-rated bonds paying 15% per year or in certificate of deposit (CD) paying 7% per year. How much money should be invested in each to realize exactly \$6000 in interest per year?

XI. Find an equation for the line that contains the point $(1, -2)$ and is parallel to the line $y = 2x - 3$.

XII. Find an equation for the line that contains the point $(1, -2)$ and is perpendicular to the line $y = 2x - 3$.

XIII. Find the center (h, k) and the radius r of the circle $x^2 + y^2 - x + 2y + 1 = 0$.