

PRE-AP ALGEBRA 2

HOMEWORK #3B

Lesson 3B.1:

1) Solve the quadratic equations for x by factoring.

a) $x^2 - 9x - 36 = 0$

b) $16x^2 - 18x - 55 = 0$

Lesson 3B.2:

2) Evaluate the expressions.

a) $\sqrt{-1.21}$

b) $(3i)^3$

c) $\sqrt{-25} \cdot \sqrt{-49}$

3) For $z_1 = -3 + 5i$ and $z_2 = 4 - 7i$, calculate

a) $z_1 + z_2$

b) $z_1 - z_2$

c) $z_1 \cdot z_2$

d) $z_1 \div z_2$

Lesson 3B.3:

4) Solve $x^2 - 4x + 7 = 0$ for x by using the Quadratic Formula.5) Construct a quadratic function $y = f(x)$ which has $x = 3 - 4\sqrt{5}$ as one of its roots. Also, by using substitution, verify that the two roots satisfy $f(x) = 0$.

Lesson 3B.4:

For problems 6 and 7, calculate $y = f(x)$ by using synthetic division.

6)

$$y = f(x) = \frac{6x^3 - 22x^2 + 16x + 11}{x - 2}$$

7)

$$y = f(x) = \frac{6x^3 + 37x^2 - 91x - 392}{x + 7}$$

Lesson 3B.5:

8) For $y = f(x) = 16x^3 + 6x^2 - 121x + 15$,a) Graph $y = f(x)$ to find its integer root.Window: $-5 \leq x \leq 5$, $-100 \leq y \leq 160$ b) Use synthetic division to help factor $y = f(x)$ into three linear factors.c) State the three roots of $y = f(x)$.9) Write $f(x) = (x - 4)(2x - 7)(5x + 8)$ in standard form.10) For $y = f(x) = x^3 - 16x^2 + 198x - 340$,a) Graph $y = f(x)$ to find its integer root.Window: $0 \leq x \leq 5$, $-100 \leq y \leq 100$ b) Use synthetic division and the Quadratic Formula to find the other two roots of $y = f(x)$.c) State the x - and y -intercepts of $y = f(x)$.

Lesson 3B.6:

11) For

$$y = f(x) = x^4 - 8x^3 - 2x^2 + 120x + 180,$$

a) Graph $y = f(x)$ with your calculator and use 2nd calc minimum and 2nd calc maximum to find the coordinates of the relative minima and maxima.Window: $-4 \leq x \leq 8$, $0 \leq y \leq 500$

b) Draw a sketch of the graph. On the sketch, label the minimum and maximum points.

c) State the portions of the domain where $y = f(x)$ is increasing and decreasing.

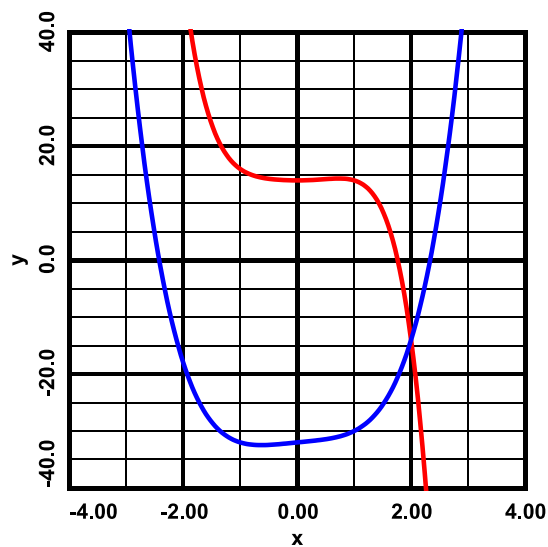
Lesson 3B.7:

- 12)** Without using your calculator, *i.e.*, by using the Leading Term Test, identify

a) $f(x) = -x^5 + 11x^2 + 14$

b) $g(x) = x^4 + 17x - 32$

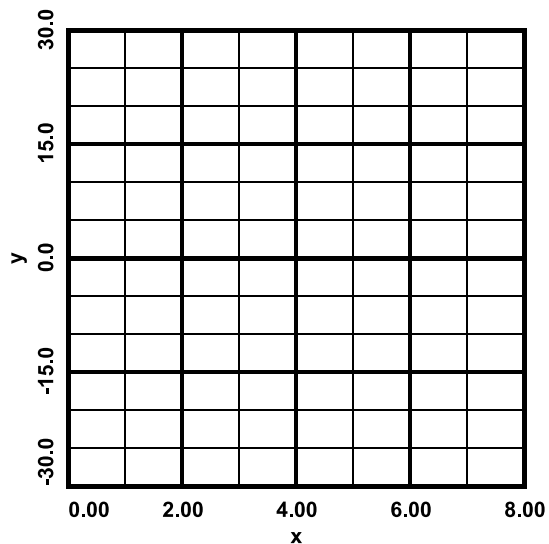
on the graph.



Problems **13** and **14** concern the function $y = f(x) = (x - 2)^2(x - 4)^3(x - 6)$.

- 13)** Draw a sketch of $y = f(x)$ which shows the correct character of the graph in the neighborhoods of its three roots.

- 14)** Check your answer to problem **13** by graphing $y = f(x)$ on the axes provided.



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Lesson 3B.8:

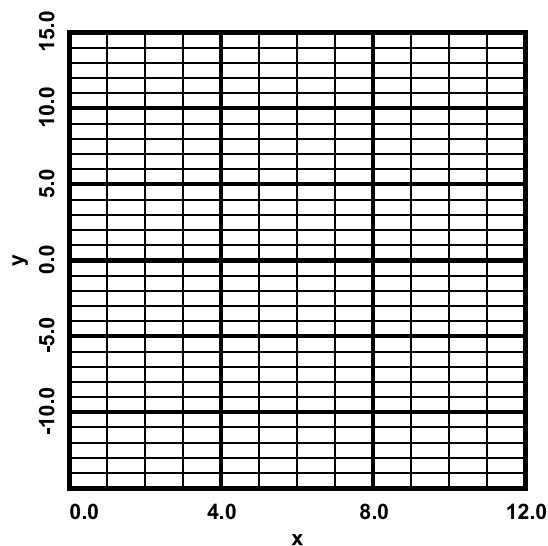
Problems **15** and **16** concern the function

$$y = R(x) = \frac{3x^2 - 39x + 120}{x^2 - 11x + 28}.$$

15) Without using your calculator, find

- a) the horizontal asymptote (H.A.)
- b) the vertical asymptotes (V.A.s)
- c) the x -intercepts
- d) the y -intercept

16) Graph $y = R(x)$ on the axes provided. Include the H.A., the V.A.s, the x -intercepts, and the y -intercept on the graph.

*Lesson 3B.9:*

17) For

$$y = R(x) = \frac{2x^2 - x - 11}{x - 3},$$

- a) Calculate the oblique asymptote (O.A.).
- b) Find the vertical asymptote (V.A.).
- c) Graph $y = R(x)$ on the axes provided. Include the O.A. and the V.A. on the graph.

