

Recitation 1: Extra Practice

September 2, 2014

1. Factor these quadratic expressions.

a) $x^2 - 25$

b) $x^2 + 6x + 9$

c) $x^2 - 8x + 15$

d) $3x^2 + 11x - 4$

e) $x^2 + x - 21$

f) $2x^2 + 4x - 1$

2. Simplify the following rational and radical expressions.

a) $\sqrt{450}$

b) $\frac{225}{600}$

c) $\sqrt{28(x-4)^2(x-5)}$

d) $\frac{x^2-4x+4}{x^2+x-6}$

e) $\sqrt{72(x^2-4)(x^2+5x+6)}$

f) $\frac{x^2-9}{x^2+6x+9}$

3. Graph the following piecewise-defined functions.

$$\text{a) } f(x) = \begin{cases} -1 & x < -1 \\ 2x - 1 & -1 \leq x < 2 \\ 1 & x \geq 2 \end{cases}$$

$$\text{b) } f(x) = \begin{cases} -x - 2 & x < -2 \\ x^2 & -2 \leq x < 1 \\ x - 4 & x \geq 1 \end{cases}$$

$$\text{c) } f(x) = \begin{cases} 2x & x < -1 \\ -x & -1 \leq x < 3 \\ (x - 2)^2 & x \geq 3 \end{cases}$$

$$\text{d) } f(x) = \begin{cases} 1 & x < -1 \\ x + 1 & -1 \leq x < 2 \\ 2 - (x - 2)^2 & x \geq 2 \end{cases}$$

$$\text{e) } f(x) = \begin{cases} x^2 & x < 0 \\ 2x & 0 \leq x < 2 \\ 4 & x \geq 2 \end{cases}$$

$$\text{f) } f(x) = \begin{cases} -(x + 1)^2 & x < -1 \\ x^2 + 2 & -1 \leq x < 2 \\ -x^2 + 5 & x \geq 2 \end{cases}$$

4. Identify the following functions as even, odd, or neither.

a) $f(x) = x^4 + 2$

b) $f(x) = x^2 + 2x$

c) $f(x) = x^5 + 4x^3 - x$

d) $f(x) = \sin(x)$

e) $f(x) = \cos(x)$

f) $f(x) = |x|$

5. Identify the center and radius of the given circles.

a) $(x - 2)^2 + (y + 5)^2 = 16$

b) $x^2 + y^2 + 4y + 4 = 25$

c) $x^4 - 6x + y^2 + 2x - 39 = 0$

d) $x^2 + 4x + y^2 = 0$

6. For each pair, P , Q , give the distance between P and Q , as well as the midpoint of the segment \overline{PQ} .

a) $P = (0, 3)$, $Q = (1, -4)$.

b) $P = (2, 5)$, $Q = (10, 13)$.

c) $P = (1, 4)$, $Q = (10, 4)$.

d) $P = (0, 0)$, $Q = (3, 4)$.