

Problem Set 5

10/6/04

2.1, # 4, 6

2.2, # 4, 10, 13, 15

2.3, # 2

2.4, # 1

Section 2.1

Problem 4.

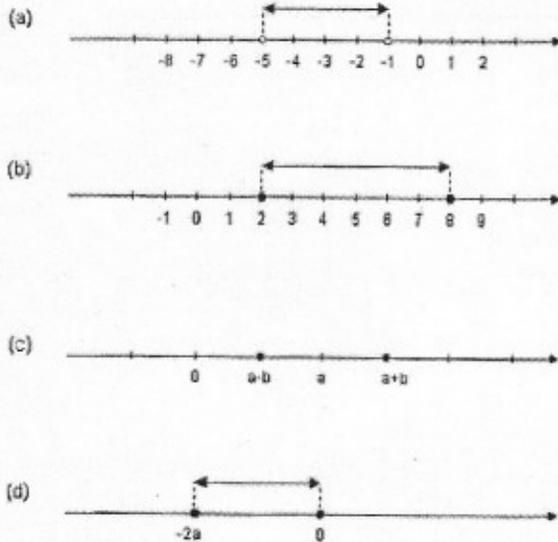
- (a) $(-3, 7)$
- (b) $[-6, 0]$
- (c) $[-6, -2], [2, 5], [9, 10]$
- (d) $[-2, 0]$
- (e) $[2, 5], [9, 10]$

Problem 6.

- (a) $f(x) = e^x$
- (b) $f(x) = -(x-1)^2 + 5$
- (c) $f(x) = (x+1)^2 - 5$
- (d) $f(x) = -(x-1)^2 - 1$
- (e) $f(x) = e^{-x}$
- (f) $f(x) = -(x+1)^2 + 5$
- (g) $f(x) = (x-1)^2 - 5$
- (h) $f(x) = -e^x$

Section 2.2

Problem 4.



Problem 10.

- (a) $x = -4, -2, 2$
- (b) $x = -3, -1, 3, 6$
- (c) $x \in (-\infty, -4) \cup [-3, -1) \cup (2, 3) \cup (3, 6)$

Problem 13.

- (a) Even: $f(-x) = (-x)^2 + 3(-x)^4 = x^2 + 3x^4 = f(x)$.
- (b) Even: $g(-x) = \frac{1}{f(-x)} = \frac{1}{f(x)} = g(x)$.

Problem 15.

- (a) Odd: $f(-x) = \frac{(-x)^2-1}{(-x)^3} = \frac{x^2-1}{-x^3} = -\frac{x^2-1}{x^3} = -f(x)$.
- (b) Even: $g(-x) = \frac{(-x)^2-1}{(-x)^4+1} = \frac{x^2-1}{x^4+1} = g(x)$.

Section 2.3

Problem 2.

- (a) $\$p(50) - \$p(20)$
- (b) $\frac{p(50)-p(20)}{p(20)} = 100 \left(\frac{p(50)-p(20)}{p(20)} \right) \%$
- (c) $\frac{p(50)-p(20)}{50-20}$ dollars per year

Section 2.4

Problem 1.

- (a) $t = 2$
- (b) There are 3 solutions: $t = -3, -1, 4$.
- (c) There are 3 solutions: $t \approx -4, 1, 3$.
- (d) $f(0) = 2$
- (e) Approximately $(-3.4, -2) \cup (-2, -0.7) \cup (3.8, 4.3)$.
- (f) Approximately $(-1, 2] \cup (4.3, 5]$.