

## Review for 1050 Midterm 1

**Distance Formula** p.4 p.9: 2a-3b

Find the distance between each pair of points.

1)  $(-5, 0), (-7, 0)$   $\sqrt{(-7-(-5))^2 + (0-0)^2}$   
 $= \sqrt{4+0} = \sqrt{4} = 2$

2)  $(-3, 7), (-2, -2)$   
 $\sqrt{82}$

3)  $(-2, -1), (-5, 0)$   $\sqrt{10}$

4)  $(-4, 6), (-8, -7)$   
 $\sqrt{185}$

**Midpoint Formula** p.5 p.9: 2a-3b

Find the midpoint of the line segment with the given endpoints.

5)  $(3, -9), (-1, 2)$   $(1, -3\frac{1}{2})$

6)  $(7, -8), (-3, 9)$   
 $(2, \frac{1}{2})$

7)  $(1, -7), (9, 3)$   $(5, -2)$

8)  $(7, 0), (-2, -9)$   
 $(2\frac{1}{2}, -4\frac{1}{2})$

**Equation of a Line in Standard Form**

p.26  $Ax + By = C$

$m = \frac{y_2 - y_1}{x_2 - x_1}$

$y = mx + b$

$y - y_1 = m(x - x_1)$

p.32: 5a-6a

Write the standard form of the equation of the line through the given points.

9) through:  $(4, -5)$  and  $(0, 5)$   $5x + 2y = 10$

10) through:  $(0, 3)$  and  $(-5, -1)$

$4x - 5y = -15$

11) through:  $(4, -4)$  and  $(5, 5)$   $y - 5 = 9(x - 5)$

12) through:  $(-5, -2)$  and  $(1, -4)$

$m = \frac{5 - (-4)}{5 - 4} = \frac{9}{1} = 9$

$y - 5 = 9x - 45$   
 $-9x + y = -40$

$x + 3y = -11$

**Equation of a Circle**

p.17  $(x - h)^2 + (y - k)^2 = r^2$  p.20: 7a, 7b

midpoint of diam is  $(h, k)$   
 $\frac{\text{length of diam.}}{2} = r$

1) Ends of a diameter:  $(13, 14)$  and  $(-13, -14)$

2) Ends of a diameter:  $(-9, -1)$  and  $(9, 1)$

$x^2 + y^2 = 365$

$x^2 + y^2 = 82$

3) Ends of a diameter:  $(-19, -6)$  and  $(19, 6)$

4) Ends of a diameter:  $(12, 3)$  and  $(-12, -3)$

$x^2 + y^2 = 397$

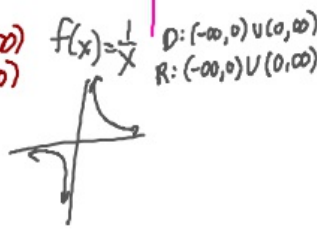
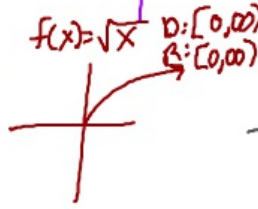
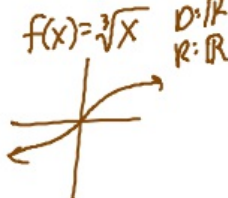
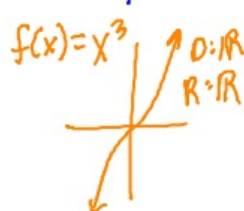
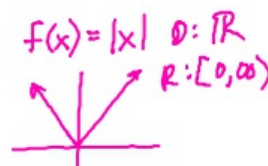
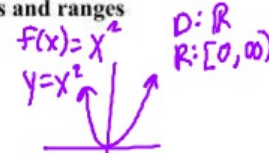
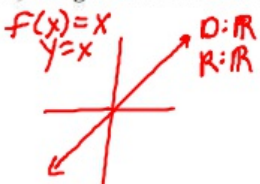
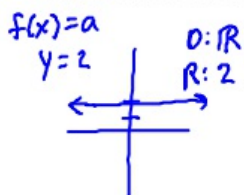
$x^2 + y^2 = 153$

$f(x) = \lfloor x \rfloor$   
 $\rightarrow 0: \mathbb{R}$   
 $\rightarrow \mathbb{R}: \text{integers}$

$\mathbb{R} = (-\infty, \infty)$

**Test for Symmetry Algebraically** p.15 p.20: 3a-4a p.106: 15-22

Know Parent Functions, along with their domains and ranges



## Domain and Range of Functions

Identify the domain and range of each.

1)  $y = \sqrt{x}$

$D: [0, \infty)$

$R: [0, \infty)$

2)  $y = 3\sqrt{x}$

$D: [0, \infty)$

$R: [0, \infty)$

3)  $y = 3\sqrt{x-4}$

$x-4 \geq 0$   
 $x \geq 4$

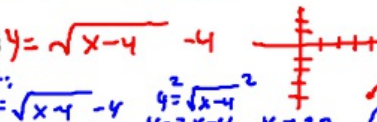
$D: [4, \infty)$   
 $R: [0, \infty)$

4)  $y = \sqrt{x-4} - 4$

$D: [4, \infty)$

$R: [-4, \infty)$

Graph Using Transformations



Find x- and y- intercepts

x-int:

$0 = \sqrt{x-4} - 4$

$+4$

$4 = \sqrt{x-4}$

$16 = x-4$

$x = 20$

$(20, 0)$

y-int:

$y = \sqrt{0-4} - 4$

$\leftarrow$  not real

no y-int.

Given a graph, evaluate at certain values, give domain and range, tell when increasing, decreasing, and constant.

Composition of Functions, state domain of composition p. 78-79

Sketch piecewise graph and evaluate at given values p. 63 p. 44: 31, 32

Inverse function, be able to find

Find the inverse of each function.

5)  $f(n) = -\frac{4}{n} - 2$

$f^{-1}(n) = -\frac{4}{n+2}$

6)  $f(x) = 1 + x^3$

$x = 1 + y^3$

$\sqrt[3]{x-1} = \sqrt[3]{y^3}$

$y = \sqrt[3]{x-1}$

$f^{-1}(x) = \sqrt[3]{x-1}$

7)  $g(x) = -\frac{1}{x-1} - 3$

$g^{-1}(x) = \frac{-1}{x+3} + 1$

8)  $f(n) = -n - 4$

$f^{-1}(n) = -n - 4$

Vertex and axis of symmetry  $a(x-h)^2 + k$

vertex:  $(h, k)$

Equation of parabola in standard form

$(-\frac{b}{2a}, f(-\frac{b}{2a}))$

vertex:  $(2, 3)$

$y = a(x-2)^2 + 3$

point:  $(0, 2)$

$y = \frac{1}{4}(x-2)^2 + 3$

$2 = a(0-2)^2 + 3$

$-1 = a(4)$

$-\frac{1}{4} = a$

$-\frac{(-4)}{2(4)} = \frac{4}{8} = \frac{1}{2}$

$f(\frac{1}{2}) = 4(\frac{1}{2})^2 - 4(\frac{1}{2}) + 21$

$= 1 - 2 + 21$

$= 20$

$(\frac{1}{2}, 20)$

$x = \frac{1}{2}$

$(4x^2 - 4x) + 21$

$4(x^2 - x + \frac{1}{4}) + 21 - 1$

$4(x - \frac{1}{2})^2 + 20$

vertex:  $(\frac{1}{2}, 20)$

axis:  $x = \frac{1}{2}$