

Math 432 Final Exam Review Packet # 1

Name: KEY

- 1) Factor completely:
- $x^3 - x^2 - 6x$

$$x(x^2 - x - 6)$$

$$x(x-3)(x+2)$$

- 2) Perform the indicated operation and express the result in simplest form:

$$\frac{a^2 - 25}{5a^2} \cdot \frac{a^2 - 5a}{a^2 - 10a + 25}$$

$$\frac{(a+5)(a-5)}{5a^2} \cdot \frac{a(a-5)}{(a-5)(a-5)}$$

$$\frac{a+5}{5a}$$

- 3) Express in simplest form:

$$\frac{3a+1}{a^2-1} - \frac{1}{a+1}$$

$$\frac{3a+1}{(a+1)(a-1)} - \frac{1}{a+1} \cdot \frac{a-1}{a-1}$$

$$\frac{3a+1-(a-1)}{(a+1)(a-1)} = \frac{2a+2}{(a+1)(a-1)} = \frac{2(a+1)}{(a+1)(a-1)} = \frac{2}{a-1}$$

- 4) Express in simplest form:

$$\frac{1}{\frac{a}{b} - \frac{1}{b}}$$

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

- 5) Solve for x:
- $\frac{x}{x-2} - \frac{8}{x+3} = \frac{10}{x^2+x-6}$

$$(x-2)(x+3) \left(\frac{x}{x-2} - \frac{8}{x+3} \right) = \frac{10}{(x+3)(x-2)} \cdot (x-2)(x+3)$$

$$x(x+3) - 8(x-2) = 10$$

$$x^2 + 3x - 8x + 16 = 10$$

$$x^2 - 5x + 6 = 0$$

$$(x-3)(x-2) = 0$$

$$x=3 \vee x=2$$

REJECT — $\frac{x}{x-2}$ is undefined when $x=2$

- 6) If
- $f(x) = x^{-2} + x^0$
- , find the value of
- $f(2)$
- .

$$2^{-2} + 2^0$$

$$\frac{1}{2^2} + 1$$

$$\frac{1}{4} + 1 = 1\frac{1}{4}$$

- 7) Express in simplest form the value of
- $2x^0 + x^{\frac{2}{3}}$
- if
- $x = 27$
- .

$$2(27)^0 + (27)^{\frac{2}{3}}$$

$$2(1) + (\sqrt[3]{27})^2 = 2 + 9 = 11$$

- 8) If
- $(\sqrt{18} + \sqrt{2})$
- is divided by
- $\sqrt{2}$
- , the result is

A) $\sqrt{10}$

$$\frac{\sqrt{9} + \sqrt{1}}{3+1}$$

B) 4

C) 3

D) 16

- 9) Express
- $\frac{2}{3-\sqrt{2}}$
- as an equivalent fraction with a rational denominator.

$$\frac{2}{3-\sqrt{2}} \cdot \frac{3+\sqrt{2}}{3+\sqrt{2}} = \frac{6+2\sqrt{2}}{9-2} = \frac{6+2\sqrt{2}}{7}$$

- 10) Express
- $5\sqrt{-18} + 6\sqrt{-98}$
- as a monomial in terms of
- i
- .

$$5 \cdot 3i\sqrt{2} + 6 \cdot 7i\sqrt{2}$$

$$15i\sqrt{2} + 42i\sqrt{2} = 57i\sqrt{2}$$

- 11) Solve for x:
- $(\sqrt{2x+3})^2 = (x)^2$

$$2x+3 = x^2$$

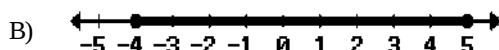
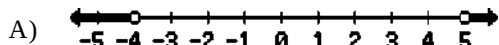
$$x^2 - 2x - 3 = 0$$

$$(x-3)(x+1) = 0$$

$$x=3 \vee x=-1$$

REJECT — extraneous root

- 12) Which graph is the solution set of
- $|2x-1| < 9$
- ?



$$2x-1 < 9 \wedge 2x-1 > -9$$

$$2x < 10 \wedge 2x > -8$$

$$x < 5 \wedge x > -4$$

$$-4 < x < 5$$

C)

D)

13) Solve for all values of x : $|6-x|=4$

$6-x=4 \quad \checkmark \quad 6-x=-4$
 $-x=-2 \quad \checkmark \quad -x=-10$
 $x=2 \quad \checkmark \quad x=10$

14) What is the inverse of the function $x+2y+3=0$?

$y+2x+3=0$
 $y=-2x-3$

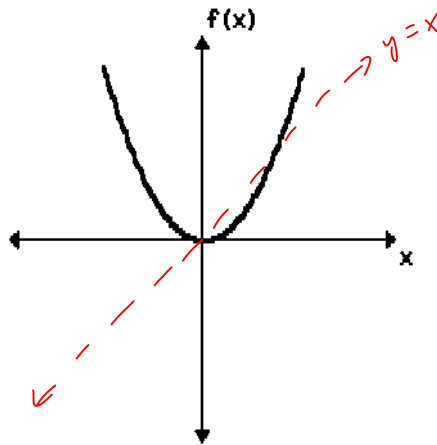
(A) $y=-2x-3$

B) $2x-y+3=0$

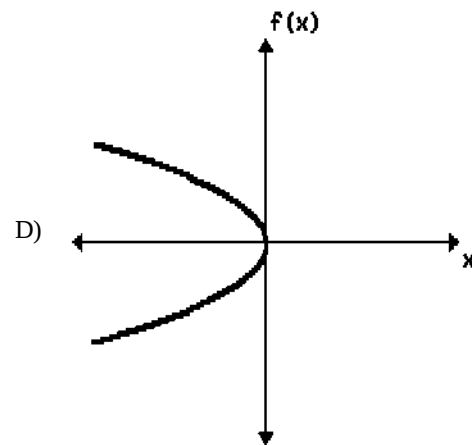
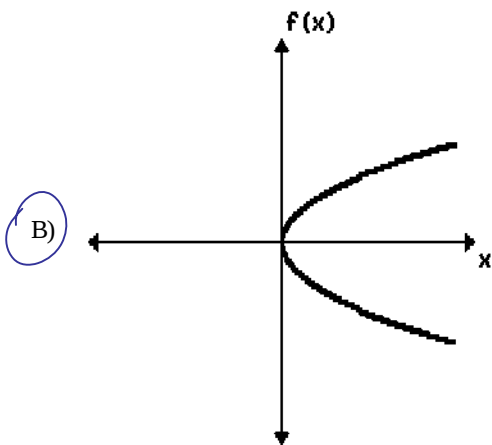
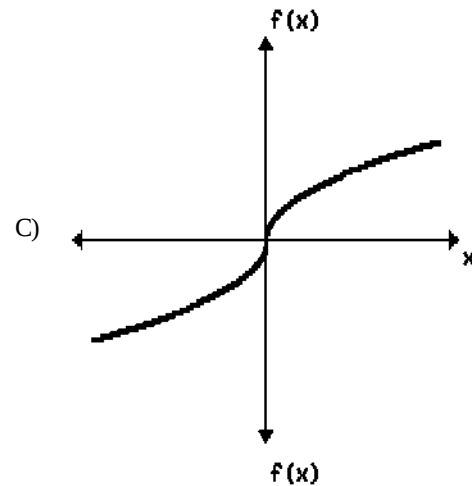
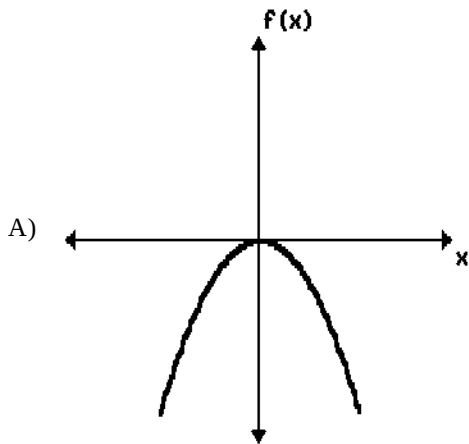
C) $2y+x+3=0$

D) $y=-\frac{1}{2}x-\frac{3}{2}$

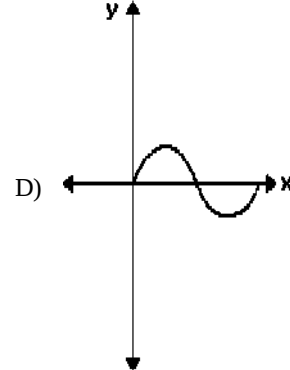
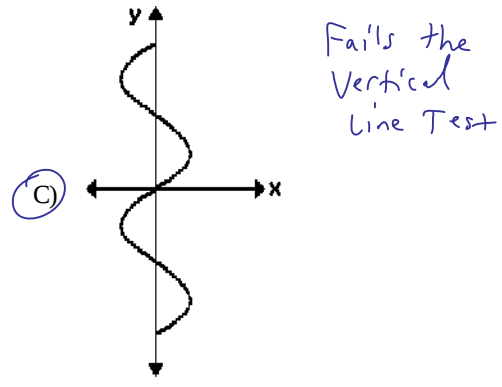
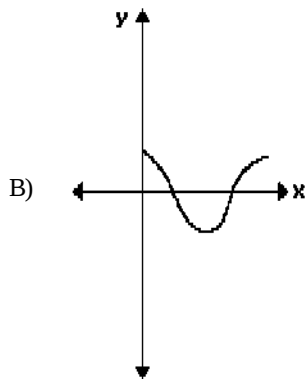
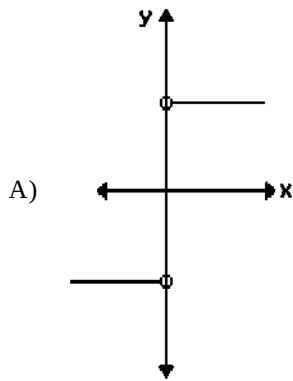
15) In the diagram below, the function $f(x)=x^2$ is represented graphically. Which graph below represents the inverse of $f(x)$?



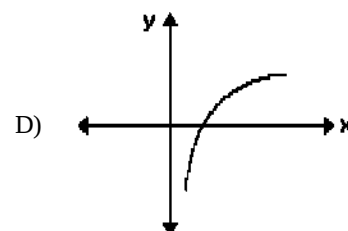
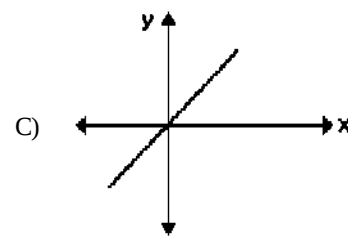
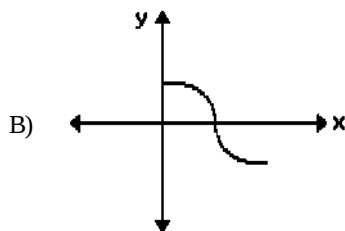
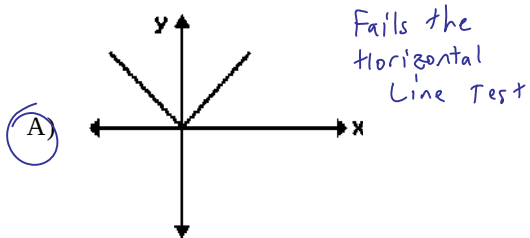
reflect over
the line
 $y=x$



16) Which diagram shows a relation that is *not* a function?



17) Which function is *not* one to one?



18) The domain for $g(x) = 5x - 1$ is $-2 \leq x \leq 2$. The smallest value in the range of $g(x)$ is

A) 11 $g(x) = 5(-2) - 1$
 $g(x) = -11$ **B) -11**

C) -9

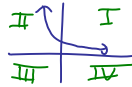
D) 9

19) For which value of x is $f(x) = \frac{x^2 - 2x + 1}{3x - 1}$ undefined? when $3x - 1 = 0$
 $x = \frac{1}{3}$

20) Write the inverse of the given function:

$\{(5,3), (-2,4), (7,-2)\}$

$\{(3,5), (4,-2), (-2,7)\}$



- 21) The graph of the equation $y = \left(\frac{1}{2}\right)^x$ lies entirely in Quadrants
- A) III and IV B) I and IV ☒ C) I and II D) II and III
- 22) If $x = 5^a$, then the value $5x$ is $5x = 5 \cdot 5^a = 5^1 \cdot 5^a = 5^{1+a} = 5^{a+1}$
- A) 6^a B) $a + 5$ ☒ C) 5^{a+1} D) $x + 1$
- 23) The probability that Team A will beat Team B in a sporting event is $\frac{2}{3}$. What is the probability that Team B will win all three games of a three-game series? $P(\text{Team B wins 1 game}) = \frac{1}{3}$
- $P(\text{B wins all 3 games}) = \frac{1}{3} \cdot \frac{1}{3} \cdot \frac{1}{3} = \left(\frac{1}{27}\right)$
- 24) If the probability that an event will occur is $\frac{1}{x+1}$, then the probability that the event will *not* occur is
- A) $-\frac{x}{x+1}$ B) $x+1$ C) $-\frac{1}{x+1}$ ☒ D) $\frac{x}{x+1}$

$$\begin{aligned}
 P(\sim E) &= 1 - P(E) \\
 &= 1 - \frac{1}{x+1} \\
 &= \frac{x+1}{x+1} - \frac{1}{x+1} \\
 &= \frac{x}{x+1}
 \end{aligned}$$