

1) State the domain for each of the following:

a. $y = \frac{2x}{6x-12}$

Rational

$$6x - 12 \neq 0$$
$$6x \neq 12$$

$$x \neq 2$$

b. $y = \sqrt{3x+9} - 5$

Sq Root

$$3x + 9 \geq 0$$

$$3x \geq -9$$

$$x \geq -3$$

c. $y = \frac{10x+4}{\sqrt{-2x+8}}$

Both

$$-2x + 8 > 0$$

$$-2x > -8$$

$$x < 4$$

2) Identify the transformations:

a. $y = |x+5| - 2$

Left 5

Down 2

b. $y = -(x-4)^2$

Ref.

Right 4

c. $y = (x+3)^3 - 1$

Left 3

Down 1

State the domain for each of the following in interval notation.

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

Domain: $x \neq 1$

$$(-\infty, 1) \cup (1, \infty)$$

Interval Notation: _____

2) $f(x) = \sqrt{3x-12}$

Domain: $x \geq 4$

Interval Notation: $[4, \infty)$

3) $f(x) = \frac{15}{\sqrt{4x+24}}$

Domain: $x > -6$

Interval Notation: $(-6, \infty)$

$$4) f(x) = \frac{4-x}{\underline{(x-2)}\underline{(4x+6)}}$$

Domain: $x \neq 2 \text{ or } -1.5$

$$(-\infty, -1.5) \cup (-1.5, 2) \cup (2, \infty)$$

Interval Notation: _____

$$5) f(x) = \sqrt{3x-9}$$

Domain: $x \geq 3$

Interval Notation: $[3, \infty)$

$$6) f(x) = \frac{6x}{\sqrt{-5x+12}}$$

Domain: $x < 2.4$

Interval Notation: $(-\infty, 2.4)$

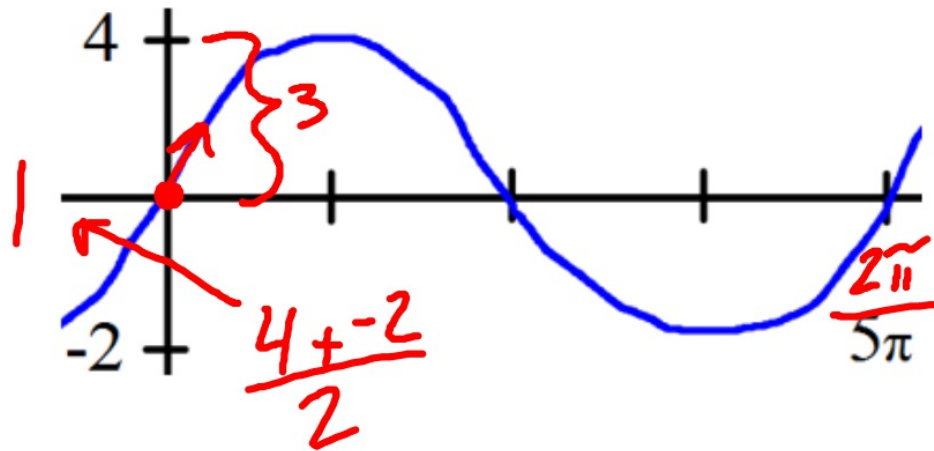
1) A football coach needs 2 offensive linemen, 3 linebackers and 2 receivers. He has 6 linemen, 5 linebackers and 8 receivers to choose from. How many different selections of players could the coach make?

$${}^6C_2 \quad {}^5C_3 \quad {}^8C_2 = 4,200$$

2) The probability of winning in a game of chance is $\frac{2}{7}$. What is the probability of winning exactly 4 of the next 12 attempts at the game?

$${}_{12}C_4 \left(\frac{2}{7}\right)^4 \left(\frac{5}{7}\right)^8 = 0.224$$

3) Write the sinusoidal equation that would match the given graph:



$$y = 3\sin\left(\frac{2}{5}x\right) + 1$$

4) What is the middle term of the expansion for $(2x + 6)^8$?

$${}^8C_4 (2x)^4 (6)^4 = 1,451,520x^4$$

5) If 8 friends are sitting at a round table, how many ways could they arrange themselves?

$$\frac{8!}{8} \quad 5,040$$

6) Write an equation with half the amplitude and double the period as the given function:

$$f(x) = 8 \cos(4x + 2) + 12$$

= a Per = $\frac{2\pi}{4} = \frac{\pi}{2} \cdot 2 = \pi$
 $8 \cdot \frac{1}{2} = 4$ $\frac{2\pi}{\pi} = 2 = b$

$$f(x) = 4 \cos(2x \dots)$$

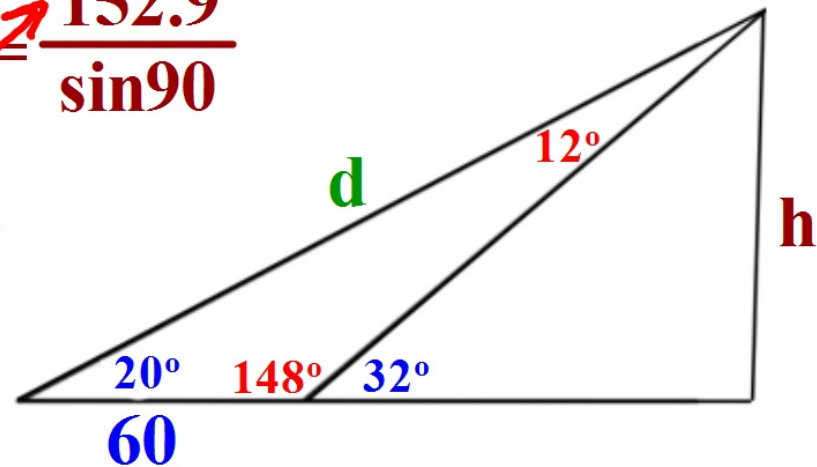
7) Henry looks up at the top of a building in the distance. The angle of elevation to the top is 20° . He walks 60 feet closer to the building and re-measures the angle of elevation to be 32° . How tall is the building?

$$\frac{d}{\sin 148} = \frac{60}{\sin 12}$$

152.9

$$\frac{h}{\sin 20} = \frac{152.9}{\sin 90}$$

52.3



8) Jules is taking a test. She has 10 questions left that she thinks she has a 65% chance of guessing correctly. What is the probability that she answers exactly 3 questions incorrect?

$${}_{10}C_3 (0.65)^7 (0.35)^3 = 0.252$$

9) Identify the phase shift in the following function:

$$f(x) = 5 \cos(6x - 2) - 8$$

$$PS = \frac{-c}{b}$$

$$2/6$$

$$1/3$$

10) A spinner has 8 sections; 3 sections are red, 2 sections are blue, one is green, one yellow and one orange. If the spinner is spun 1,000 times, how many times would each color be expected to be landed on?

$$\frac{3}{8}(1000) = \begin{array}{ccccc} \text{Red} & \text{Blue} & \text{Green} & \text{Yellow} & \text{Orange} \\ 375 & 250 & 125 & 125 & 125 \end{array}$$

Study these questions... Remember, the quiz on these will be the one quiz you do not get to use your notes.

Unit 5:
Functions
Review Monday
& Function Values

Type

Transformations

Interval Notation

Domain

Range

Pos / Neg Intervals

Inc / Dec Intervals

Domain Special Cases...

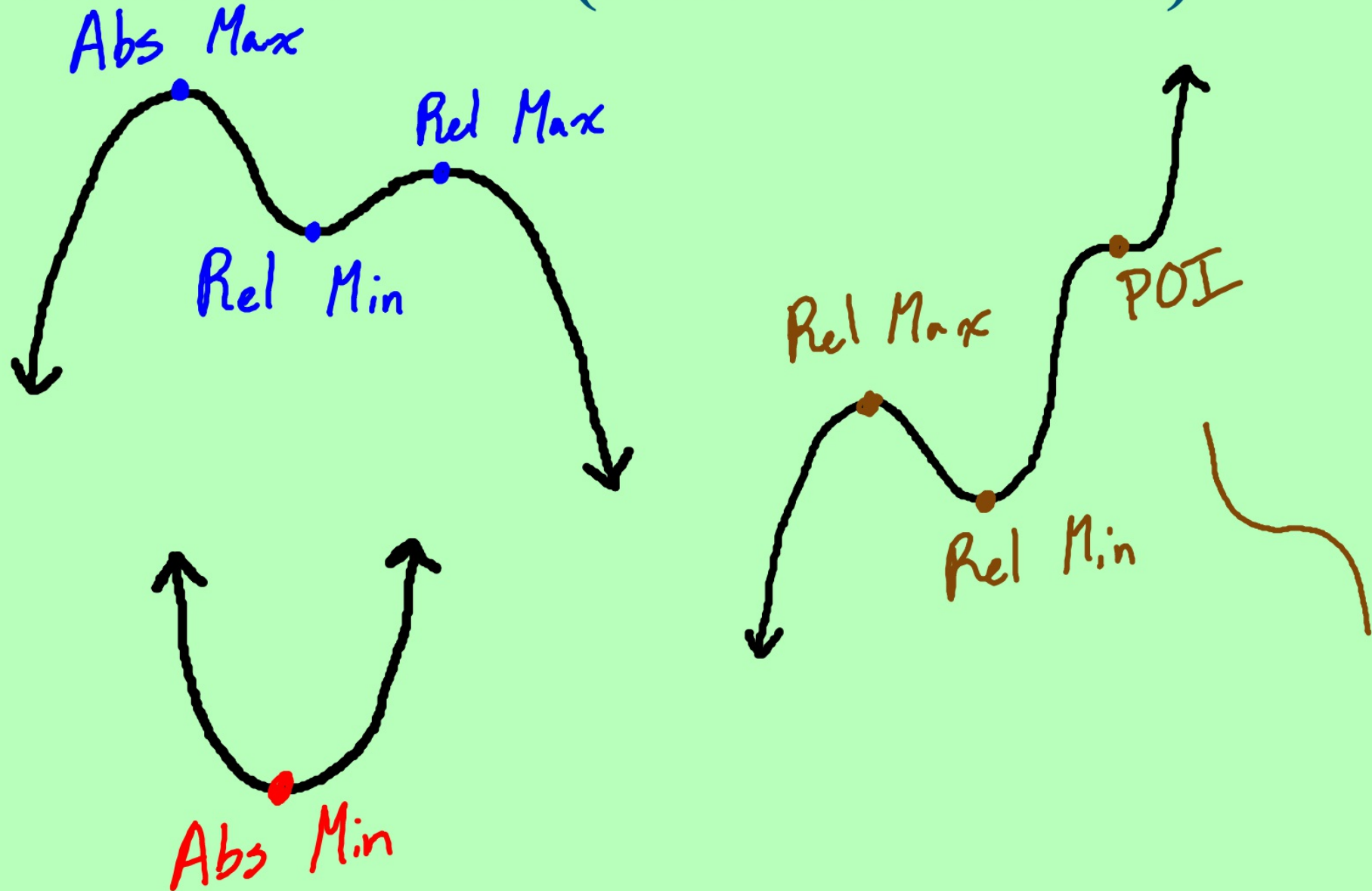
(Examples in Warm Up)

Rational $\neq 0$

Square Root ≥ 0

Both > 0

Critical Points (Extrema + POI)



End Behavior

Notation:

$$\begin{array}{l} \text{as } x \xrightarrow{\text{(Left)}} -\infty, f(x) \rightarrow \underline{\hspace{2cm}} \quad \begin{array}{l} \infty \text{ (Up)} \\ -\infty \text{ (Down)} \end{array} \\ \text{as } x \xrightarrow{\text{(Right)}} \infty, f(x) \rightarrow \underline{\hspace{2cm}} \end{array}$$

New...

Even / Odd Function

Refers to the largest exponent

Even = Same Direction at Ends

Odd = Opposite Direction at Ends

Positive / Negative Function

Refers to the Term with largest exponent

Positive







Negative



End Behavior From an Equation Without a Calculator...

- 1) Find the largest exponent
- 2) Is the exponent even or odd?
- 3) Is the term (not exponent) positive or negative?

	even exponent	odd exponent
+	 as $x \rightarrow -\infty$, $f(x) \rightarrow \infty$ as $x \rightarrow \infty$, $f(x) \rightarrow \infty$	 $-\infty$ ∞
-	 $-\infty$ $-\infty$	 ∞ $-\infty$

Independent Practice

Describe the end behavior of each function.

1) $f(x) = x^3 - 4x^2 + 7$

as $x \rightarrow -\infty$, $f(x) \rightarrow -\infty$

as $x \rightarrow \infty$, $f(x) \rightarrow \infty$

2) $f(x) = -x^3 - 9x^2 + 24x - 15$

Odd/Neg

as $x \rightarrow -\infty$, $f(x) \rightarrow \infty$

as $x \rightarrow \infty$, $f(x) \rightarrow -\infty$

3) $f(x) = x^2 - 6x + 11$

Even/Pos

as $x \rightarrow -\infty$, $f(x) \rightarrow \infty$

as $x \rightarrow \infty$, $f(x) \rightarrow \infty$

4) $f(x) = x^5 - 4x^3 + 5x + 2$

Odd/Pos

as $x \rightarrow -\infty$, $f(x) \rightarrow -\infty$

as $x \rightarrow \infty$, $f(x) \rightarrow \infty$

5) $f(x) = -x^2 + 4x$

Even/Neg

as $x \rightarrow -\infty$, $f(x) \rightarrow -\infty$

as $x \rightarrow \infty$, $f(x) \rightarrow -\infty$

Function Values

A. If $f(x) = x^2 - 2x - 8$, find the function value for $f(3)$.

$$(3)^2 - 2(3) - 8 = \boxed{-5}$$

B. $f(-4)$

$$(-4)^2 - 2(-4) - 8$$

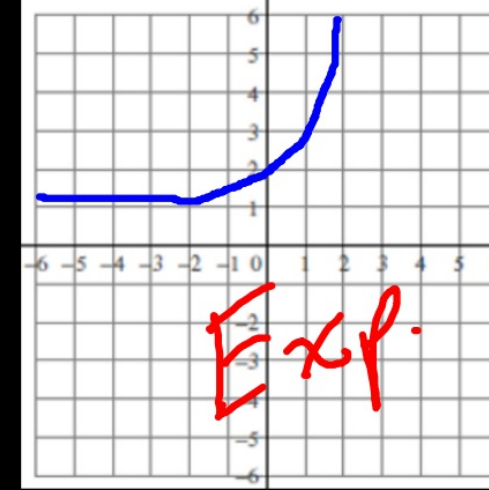
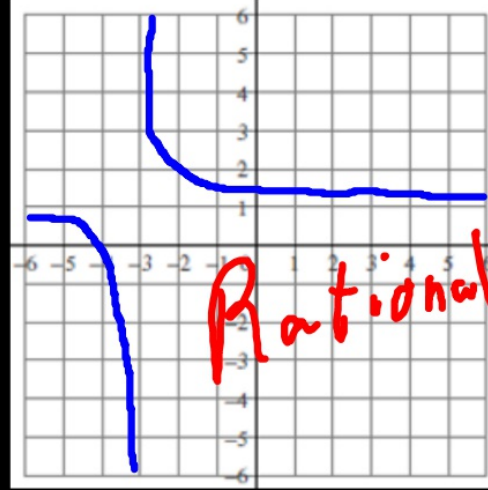
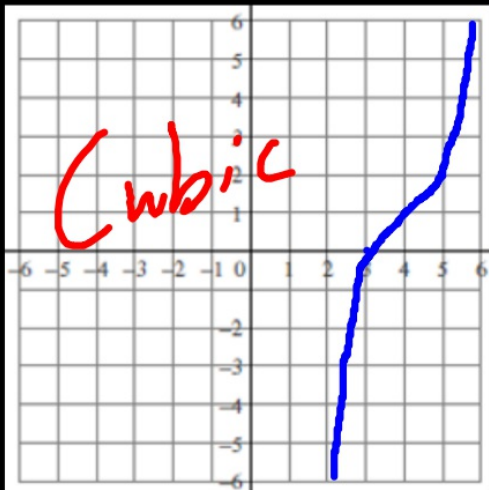
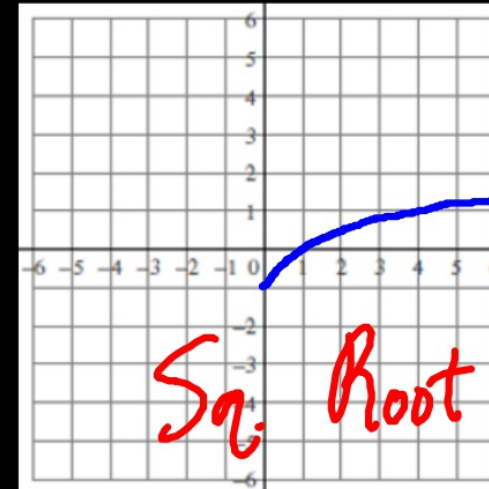
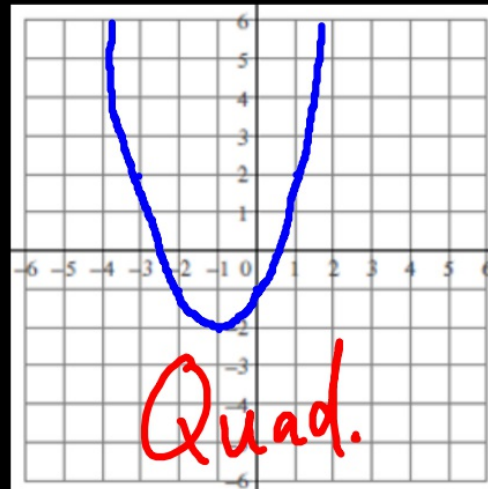
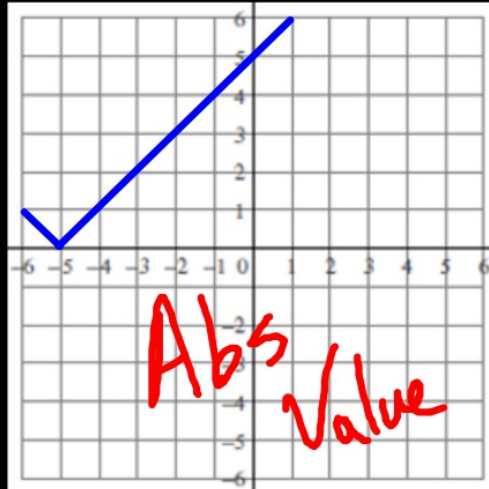
$$\boxed{16}$$

C. $f(5)$

$$(5)^2 - 2(5) - 8$$

$$\boxed{7}$$

Identify the type of function in each graph:



Piecewise Functions

piecewise function -
a function that cannot be
represented by a single
equation

Ex. A job that pays more for overtime

$$h(x) = \begin{cases} 1.6x - 41.6 & \text{if } 63 < x < 66 \\ 3x - 132 & \text{if } 66 \leq x \leq 68 \\ 2x - 66 & \text{if } x > 68 \end{cases}$$

a) $h(64)$ 1st
 $1.6(64) - 41.6$
 60.8

b) $h(70)$ 3rd
 $2(70) - 66$
 74

c) $h(66)$ 2nd
 $3(66) - 132$
 66

d) $h(60)$
 \emptyset

e) $h(68)$ 2nd
 $3(68) - 132$
 72

f) $h(74)$ 3rd
 $2(74) - 66$
 82

Tomorrow's Quiz

Domain Special Cases

Critical Points

End Behavior

That's it

Assignment::

WB 506

#1-4 AND 1st 4 Graphs

E.C. for All

Write out full notation for full credit.

WB 507 (Due Fri) if you finish early