

DOMAIN and RANGE

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Expanding Binomials Using Pascal's Triangle

Expanding $(a + b)^n$

$$(a+b)^0 = 1$$

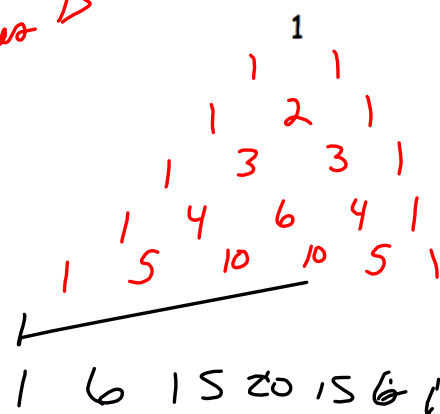
$$(a+b)^1 = a + b$$

$$(a+b)^2 = a^2 + 2ab + b^2$$

$$(a+b)^3 = a^3 + 3a^2b + 3ab^2 + b^3$$

$$(a+b)^4 = a^4 + 4a^3b + 6a^2b^2 + 4ab^3 + b^4$$

Coefficients:

Pascal's Triangle


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What patterns are there?

1. Exponents of "a" (first term): Start at 'n' and descend to zero.
2. Exponents of "b" (second term): Start at zero and ascend to 'n'.
3. The coefficients: follow Pascal's Δ above
4. The number of terms in the expansion: $n+1$

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Examples:

$n=3$, 4 terms $\Delta \rightarrow 1 \ 3 \ 3 \ 1$

1. Expand: $(x - y)^3 = 1(x^3(-y)^0) + 3(x^2(-y)^1) + 3(x^1(-y)^2) + 1(x^0(-y)^3)$
 $= x^3 - 3x^2y + 3xy^2 - y^3$

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2. Expand: $(2a - 1)^3$

1 3 3 1

 $a = 2a$ $b = -1$

$$= 1 \underline{(2a)^3(-1)^0} + 3 \underline{(2a)^2(-1)^1} + 3 \underline{(2a)^1(-1)^2} + 1 \underline{(2a)^0(-1)^3}$$

$$= 1(8a^3)(1) + 3(4a^2)(-1) + 6a(1) + 1(1)(-1)$$

$$= \underline{8a^3 - 12a^2 + 6a - 1}$$

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3. Expand: $(x + h)^3$

1 3 3 1

$$= 1 \underline{(x)^3(h)^0} + 3 \underline{(x)^2(h)^1} + 3 \underline{(x)^1(h)^2} + 1 \underline{(x)^0(h)^3}$$

$$= x^3 + 3x^2h + 3xh^2 + h^3$$

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Homework Answers

Omit #4 on HW t'nite

pg 86 - 88:

2. yes
4. no, 1 maps to 4 & 6

6. yes

8. yes

20. no, 5 maps to 0 & -1
3 maps to -1 & -2

D: {5, 3, 0}

R: {0, -1, -2}

22. $t(-4) = 3$; $t(0) = 3$; $t(3) = 3$

24. $g(-4) = 3/2$; $g(-1) = -3$; $g(0) = -5/2$

26. $g(-2) = 4$; $g(0) = -4$; $g(2.4) \approx -2.6176$

28. a. 0

b. 1

c. 57

d. $5t^2 + 4t$

e. $5t^2 - 6t + 1$

29. a. 8

d. $27y^3$

b. -8

e. $8 + 12h + 6h^2 + h^3$

c. $-x^3$

31. a. $1/8$

d. $81/53$

b. 0

e. $\frac{x+h-4}{x+h+3}$

c. dne

31d) $g(x) = \frac{x-4}{x+3}$

31e) $g(x+h) = \frac{x+h-4}{x+h+3}$

$$\begin{aligned} g(-16.25) &= \frac{-16.25-4}{-16.25+3} \\ &= \frac{-20.25}{-13.25} \end{aligned}$$

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OCC College Credit:

Pre-Req: Passed Alg2CC & Regents

Must register before next Friday Sept. 13th

Link to instructions on my website

Why you should register... or not

Why you should consider

o No cost

o 4 credits at OCC

o May transfer to your non-OCC college

Why you might not (you have this choice)

o Struggling student won't want a poor grade to average into OCC average if attending there.

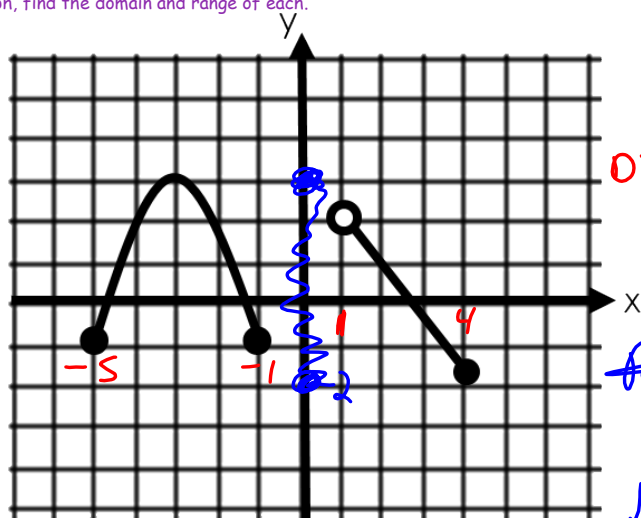
o Cannot drop out of OCC course after the Sept 14th without showing a failure on OCC transcript. This affects FASFA financial aid application in a bad way whether you go to OCC or any college.

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Given the graph, find the domain and range of each.

Start on the back

6.



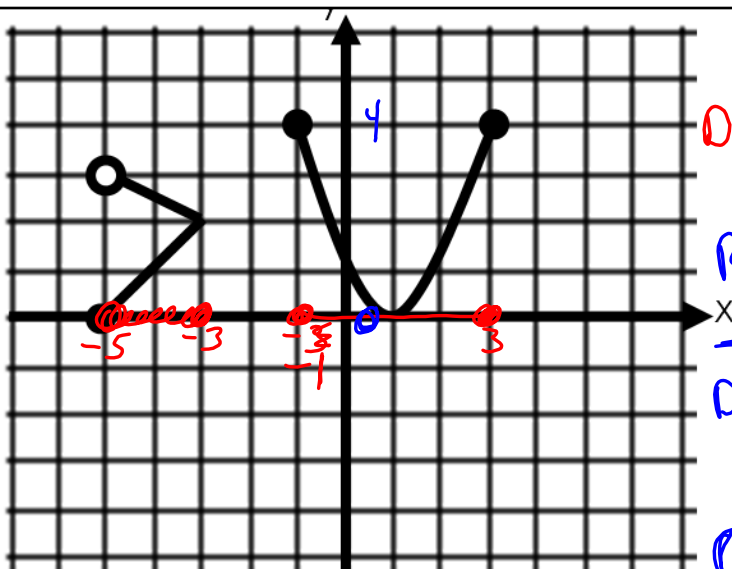
$$D: \{x | -5 \leq x \leq -1 \text{ or } 1 < x \leq 4\}$$

$$\cancel{R: \{y | -2 \leq y \leq 3\}}$$

$$R: \{y | -2 \leq y \leq 3\}$$

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7.



$$D: \{x | -5 \leq x \leq -3 \text{ or } -1 \leq x \leq 3\}$$

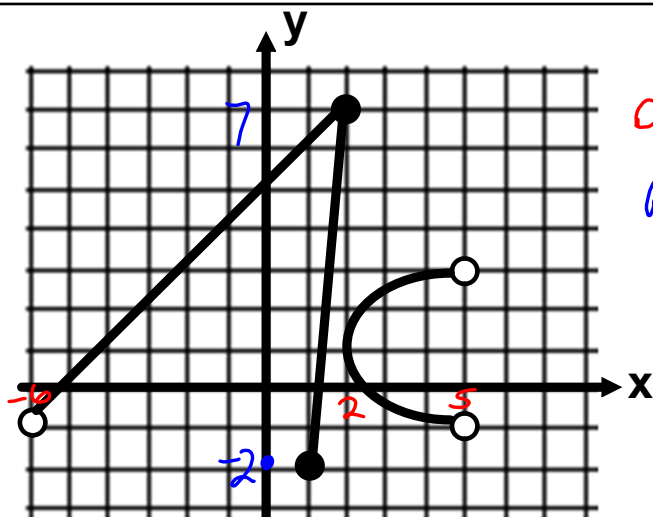
$$R: \{y | 0 \leq y \leq 4\}$$

$$D: [-5, -3] \text{ or } [-1, 3]$$

$$R: [0, 4]$$

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8.



$$D: \{x \mid -6 < x < 5\}$$

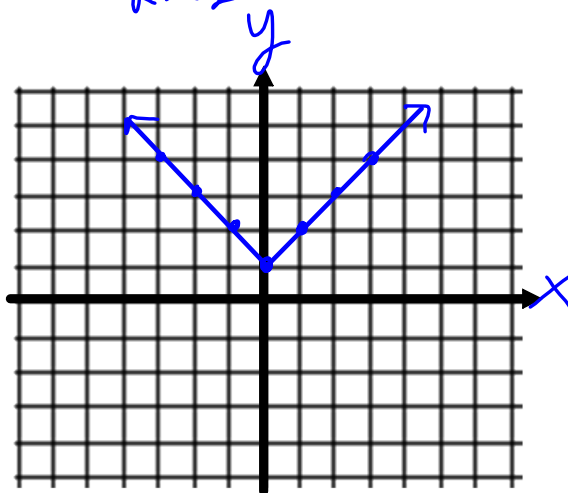
$$R: \{y \mid -2 \leq y \leq 7\}$$

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Graph each of the following. Show a table of at least 5 values.
State domain and range.

1. $y = |x| + 1$

x	y
-2	3
-1	2
0	1
1	2
2	3



$$D: \{x \mid x \in \mathbb{R}\}$$

$$R: \{y \mid y \geq 1\}$$

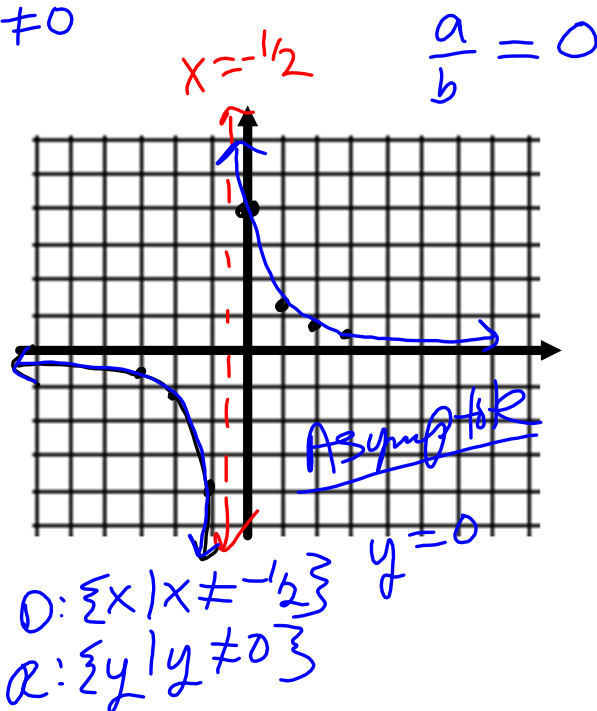
$$(-\infty, \infty)$$

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2. $f(x) = \frac{4}{(2x+1)}$ *denom $\neq 0$*

denom $\neq 0$
 $2x+1 \neq 0$
 $2x \neq -1$
 $x \neq -\frac{1}{2}$
(asymptote)

x	y
-3	-0.8
-2	-1.3
-1	-4
0	4
1	1.3
2	0.8
3	0.6



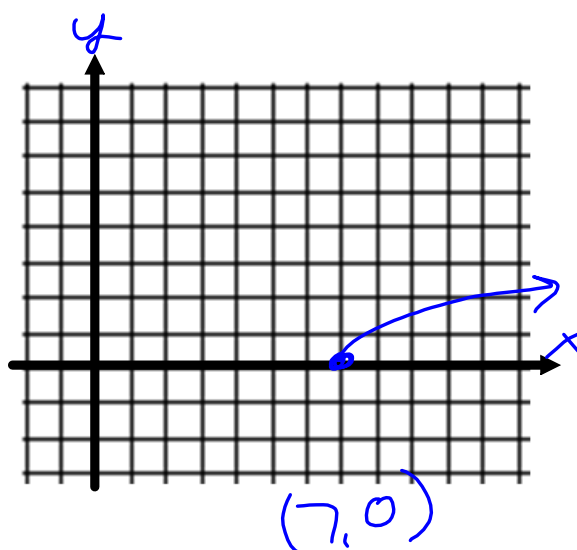
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3. $y = \sqrt{x-7}$ *real # function*

radicand ≥ 0
 $x-7 \geq 0$
 $x \geq 7$

x	y
7	0
8	1
9	1.4

$D: \{x | x \geq 7\}$
 $R: \{y | y \geq 0\}$



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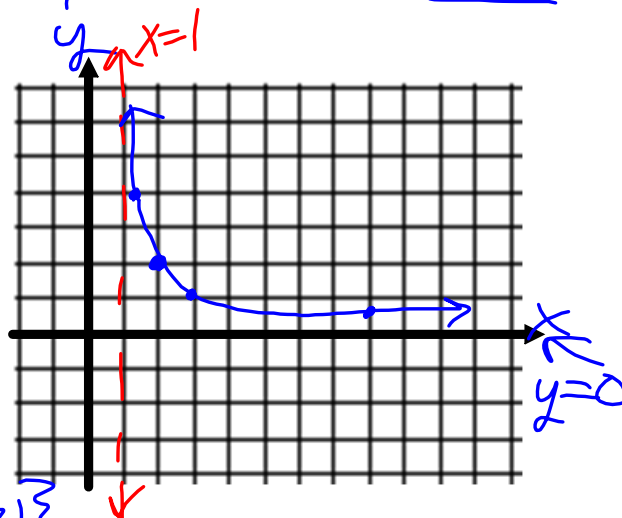
4. $y = \frac{2}{\sqrt{x-1}}$

radicand ≥ 0
denom $\neq 0$ $\rightarrow$ radicand > 0

$$x-1 > 0$$

$$x > 1$$

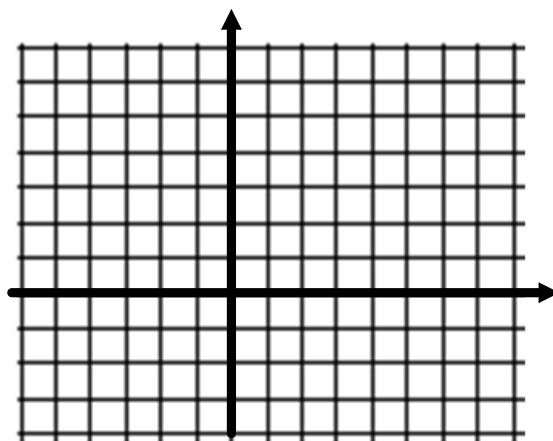
x	y
2	2
4	1.15
5	1
10	.67
1.25	4



$D: \{x | x > 1\}$
 $R: \{y | y > 0\}$

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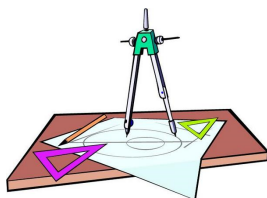
5. $f(x) = \frac{3}{\sqrt{x^2 - 2x - 3}}$



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Homework: Ditto 1

Quiz on Chap 1 Next Friday



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