T/PC
Transformations - Fcn Fams HW 1

1. $y = \frac{1}{3}\left(\frac{1}{5}\right)^{-(x-9)} + 2$ parent: $y = \left(\frac{1}{5}\right)^x$

$a = \frac{1}{3}$ vertical shrink of $\frac{1}{3}$
$b = -1$ horizontal reflection
$h = 9$ translation 9R
$k = 2$ translation 2U

2. $y = (x+7)^3 + 3$ parent: $y = x^3$

$a = 1$ —
$b = 1$ —
$h = -7$ translation 7L
$k = 3$ translation 3U

3. $y = -|2x|-3$ parent: $y = |x|$

$a = -1$ vertical reflection
$b = 2$ horizontal shrink of $\frac{1}{2}$
$h = 0$ —
$k = -3$ translation 3D

4. $y = \frac{1}{x-5} - 6$ parent: $y = \frac{1}{x}$

$a = 1$ —
$b = 1$ —
$h = 5$ translation 5R
$k = -6$ translation 6D

5. $y = -\sqrt{x-8}$ parent $y = \sqrt{x}$

$a = -1$ vertical reflection
$b = 1$ —
$h = 8$ translation 8R
$k = 0$ —

6. $y = \frac{1}{5}(x-4)^2+1$ parent: $y=x^2$

$a = 1/5$ vertical shrink of $1/5$

$b = 1$ —

$h = 4$ translation 4R

$k = 1$ translation 1U

7. $y = \sqrt[3]{3(x+1)}+7$ parent: $y = \sqrt[3]{x}$

$a = 1$ —

$b = 3$ horizontal shrink of $1/3$

$h = -1$ translation 1L

$k = 7$ translation 7U

8. $y = 2^{4(x+10)}$ parent: $y = 2^x$

$a = 1$ —

$b = 4$ horizontal shrink of $1/4$

$h = -10$ translation 10L

$k = 0$ —

9. $y = \frac{2}{11}\log x + 10$ parent: $y = \log x$

$a = 2/11$ vertical shrink of $2/11$

$b = 1$ —

$h = 0$ —

$k = 10$ translation 10 U

10. $y = \frac{-2}{(x+7)^2} - 4$

$a = -2$ vertical reflection, vertical stretch of 2

$b = 1$ —

$h = -7$ translation 7 L

$k = -4$ translation 4 D

T-PC
Function Families
Describing Transformations

WS 2

6. Parent Fcn: $y = (3/2)^x$ $y = -\left(\frac{3}{2}\right)^{-2(x-1)} + 7$

a = -1 vertical reflection

b = -2 horizontal reflection, horizontal shrink of 1/2

h = 1 translation 1R

k = 7 translation 7U

7. Parent Fcn: $y = x^2$ $y = (5x)^2 + 1$

a = 1 —

b = 5 horizontal shrink of 1/5

h = 0 —

k = 1 translation 1U

8. Parent Fcn: $y = \log x$ $y = 6\log(-x) - 4$

a = 6 vertical stretch of 6

b = -1 horizontal reflection

h = 0 —

k = -4 translation 4D

9. Parent Fcn: $y = \cos x$ $y = \frac{2}{3}\cos 2(x-1)$

a = 2/3 vertical shrink of 2/3

b = 2 horizontal shrink of 1/2

h = 1 translation 1R

k = 0 —

10. Parent Fcn: $y = \sin x$ $y = -\sin 2x - 1$

a = -1 vertical reflection

b = 2 horizontal shrink of 1/2

h = 0 —

k = -1 translation 1D

T-PC
Function Families
Describing Transformations
For each problem, give the parent function, tell what a,b,h,k are, then describe the transformations using the proper vocabulary: stretch/shrink/reflection/translation/horizontal/vertical/#'s w/ R,L,U,D

1. Parent Fcn: $y = \tan x$ $y = 3\tan(-2(x-\pi))-1$
   a = 3 vertical stretch of 3
   b = -2 horizontal reflection, horizontal shrink of ½
   h = π translation π R
   k = -1 translation 1 D

2. Parent Fcn: $y = \sqrt[4]{x}$ $y = -\frac{2}{3}\sqrt[4]{x+7}+5$
   a = $-\frac{2}{3}$ vertical shrink of ⅔, vertical reflection
   b = 1 —
   h = -7 translation 7 L
   k = 5 translation 5 U

3. Parent Fcn: $y = |x|$ $y = |9(x-6)|+12$
   a = 1 —
   b = 9 horizontal shrink of 1/9
   h = 6 translation 6 R
   k = 12 translation 12 U

4. Parent Fcn: $y = \sqrt[5]{x}$ $y = 2\sqrt[5]{-x}+8$
   a = 2 Vertical stretch of 2
   b = -1 horizontal reflection
   h = 0 —
   k = 8 translation 8 U

5. Parent Fcn: $y = \frac{1}{x^4}$ $y = \frac{1}{2(x+1)^4}-5$
   a = ½ vertical shrink of ½
   b = 1 —
   h = -1 translation 1 L
   k = -5 translation 5 D

TIPC
Fcn Fam
WS 3

Words to Eqns

1. $a = -3$, $b = 1$, $h = -3$, $k = 4$ — $y = -3(x+3)^2 + 4$

2. $a = 1/4$, $b = -1$, $h = 8$, $k = -2$ — $y = \frac{1}{4(-(x-8))^2} - 2$

3. $a = 5$, $b = 2$, $h = 0$, $k = 7$ — $y = 5\log(2x) + 7$

4. $a = 1$, $b = 1/4$, $h = -3$, $k = 0$ — $y = \tan(1/4(x+3))$

5. $a = -1$, $b = -1$, $h = -2$, $k = 0$ — $y = -\sqrt{-1(x+2)}$

6. $a = -2/3$, $b = 1$, $h = 1$, $k = 1$ — $y = -2/3|x-1| + 1$

7. $a = 10$, $b = $ —, $h = $ —, $k = -9$ — $y = 10x - 9$

8. $a = 1$, $b = 1/7$, $h = -\pi/2$, $k = -6$ — $y = \cos 7(x + \pi/2) - 6$

9. $a = 1$, $b = 1$, $h = -4$, $k = 2$ — $y = \frac{1}{x+4} + 2$

10. $a = -1$, $b = 1/10$, $h = 3$, $k = -5$ — $y = -\sqrt[3]{\frac{1}{10}(x-3)} - 5$

11. $y = x^3$

$a = 5/4$ vertical stretch of $5/4$

$b = 1$ —

$h = 1$ translation 1R

$k = 7$ translation 7U

12. $y = \sin x$

$a = -1$ vertical reflection

$b = 1/4$ horizontal stretch of 4

$h = -1$ translation 1L

$k = -3$ translation 3D

13. $y = x$

$a = 6$ vertical stretch of 6

$b =$ — —

$h =$ — —

$k = 9$ translation 9U

14. $y = \log x$

$a = +1$ —

$b = -3$ horizontal reflection, horizontal shrink of $1/3$

$h = 1$ translation 1R

$k = -8$ translation 8D