Finals Review Solutions

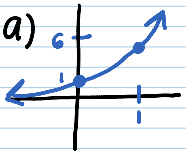
Thursday, June 05, 2014
5:47 PM

① a) $(-3)^8$ b) y^{20} c) $(b+2)^{24}$ d) $-64x^2y^2$

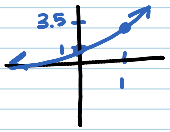
② a) $\frac{5^6}{5^3} = 5^3$ b) 17^4 c) $\frac{49x^{10}}{y^4}$ d) $\frac{6}{7r^{10}} \cdot \frac{r^{25}}{s^5} = \frac{6r^{15}}{7s^5}$

③ a) 1 b) $\left(\frac{3}{2}\right)^3 = \frac{27}{8}$

④ a) 7.812×10^4 b) 1.197×10^{-1}

⑤ a) 

D: $(-\infty, \infty)$
R: $(0, \infty)$

b) 

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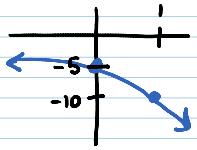
c) 

D: $(-\infty, \infty)$
R: $(-\infty, 0)$

⑥ a) growth $y = 4^x$ b) $1 = 3(b)^1$ $\frac{1}{3} = b$ decay $y = 3\left(\frac{1}{3}\right)^x$

⑦ a) $x^3 - 8x^2 + 15x$ b) $11y^5 + 4y^2 - y - 3$

⑧ a) $x^3 - 3x^2 - 2x^2 - 6x + x - 3$
$x^3 - 5x^2 - 5x - 3$

b) $x^2 - 2x - 8$ c) $18n^2 + 27n + 7$

d) $3x^2 + 10x - 8$ e) $36y^2 + 12y + 1$ f) $16a^2 - 24a + 9$

g) $k^2 - 49$ h) $9s^2 - 25$

⑨ a) $3t(t-11) = 0$
$3t = 0$ $t - 11 = 0$
$t = 0, t = 11$

b) $m^2 - 9m = 0$
$m(m-9) = 0$
$m = 0, m = 9$

c) $21h^2 - 7h = 0$
$7h(3h-1) = 0$
$7h = 0$ $3h - 1 = 0$
$h = 0, h = 1/3$

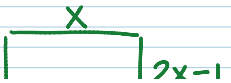
⑩ a) $(s+11)(s-1)$ b) $(a+12)(a-7)$ c) $(x+8)(x-4)$ d) $(c+5)(c+3)$

⑪ a) $7x^2 - 8x + 1 = 0$
$(7x-1)(x-1) = 0$
$7x - 1 = 0$ $x - 1 = 0$
$x = 1/7, x = 1$

b) $3s^2 + 4s - 4 = 0$
$(3s+2)(s-2) = 0$
$3s + 2 = 0$ $s - 2 = 0$
$s = -2/3, s = 2$

c) $-4r^2 - 18r - 18 = 0$
$-2(2r^2 + 9r + 9) = 0$
$-2(2r+3)(r+3) = 0$
$2r + 3 = 0$ $r + 3 = 0$
$r = -3/2, r = -3$

⑫ $y = -16t^2 + 46t + 6$
$11 = -2(8t^2 - 23t - 3)$

⑬ 

$x(2x-1) = 21$

(12) $y = -16t^2 + 46t + 6$

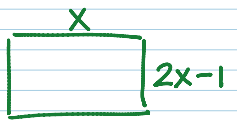
$y = -2(8t^2 - 23t - 3)$

$y = -2(8t + 1)(t - 3)$

$8t + 1 = 0$, $t - 3 = 0$

$t = -\frac{1}{8}$, $t = 3$ sec

(13)



$2(7/2) - 1$

$7 - 1$

6 inches

$x(2x - 1) = 21$

$2x^2 - x - 21 = 0$

$(2x - 7)(x + 3) = 0$

$2x - 7 = 0$, $x - 3 = 0$

$x = 7/2$, $x = 3$

(14) a) $(z + 15)(z - 15)$

b) $12(1 - 4n^2)$

$12(1 + 2n)(1 - 2n)$

c) $(4p - 1)(4p - 1)$

OR $(4p - 1)^2$

d) $y(y + 3) + x(y + 3)$

$(y + x)(y + 3)$

e) $5s^2(s^2 - 25)$

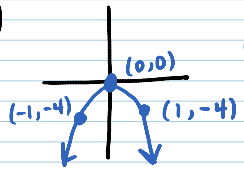
$5s^2(s + 5)(s - 5)$

f) $b^2(2b + 3) - 4(2b + 3)$

$(b^2 - 4)(2b + 3)$

$(b + 2)(b - 2)(2b + 3)$

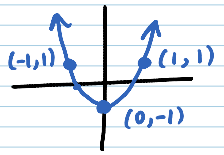
(15) a)



① reflected over x-axis

② vertical stretch by 4

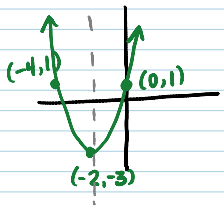
b)



① vertical stretch by 2

② ↓ 1

(16) a)



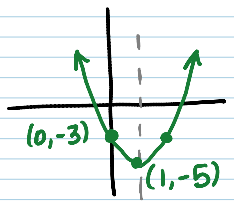
vertex: $-\frac{b}{2a} = \frac{-4}{2(1)} = -2$

$y = (-2)^2 + 4(-2) + 1$

$y = 4 - 8 + 1$

$y = -3$

b)



vertex: $-\frac{b}{2a} = \frac{4}{2(2)} = 1$

$y = 2(1)^2 - 4(1) - 3$

$y = 2 - 4 - 3$

$y = -5$

(17) a) use calculator! find zeros

NO SOLUTION

b) $-x^2 - 7x + 8 = 0$

$x = -8, 1$

(18) a) $3x^2 + 7 = 4$

$\frac{3x^2}{3} = \frac{-3}{3}$

$\sqrt{x^2} = \sqrt{-1}$

no solution

b) $7n^2 + 5 = 9$

$7n^2 = 4$

$\sqrt{n^2} = \sqrt{\frac{4}{7}}$

$n = \pm 0.76$

c) $3(w - 4)^2 = 5$

$\sqrt{(w - 4)^2} = \sqrt{\frac{5}{3}}$

$w - 4 = \pm 1.29$

$w = 4 \pm 1.29 = 2.71, 5.29$

(19) a) $x^2 - 14x + 49 = 51 + 49$

$\sqrt{(x - 7)^2} = \sqrt{100}$

$x - 7 = \pm 10$

$x = -3, 17$

b) $2a^2 + 12a - 4 = 0$

$2a^2 + 12a = 4$

$2(a^2 + 6a) = 4$

$a^2 + 6a = 2$

$a^2 + 6a + 9 = 2 + 9$

$(a + 3)^2 = 11$

$a + 3 = \pm\sqrt{11}$

$a = -6.32, .32$

c) $3g^2 - 3g = 3$

$3(g^2 - g) = 3$

$g^2 - g = 1$

$g^2 - g + \frac{1}{4} = 1$

$\sqrt{(g - \frac{1}{2})^2} = \sqrt{1}$

$g - \frac{1}{2} = \pm 1$

$g = \frac{3}{2}, -\frac{1}{2}$

$a+3=\pm\sqrt{11}$

$a=-6.32, .32$

$g-\frac{1}{2}=\pm 1$

$g=\frac{3}{2}, -\frac{1}{2}$

20 a) $x=\frac{-7\pm\sqrt{7^2-4(2)(-3)}}{2(2)}$

$x=.39, -3.89$

b) $x=\frac{7\pm\sqrt{(-7)^2-4(5)(1)}}{2(5)}$

$x=0.16, 1.24$

c) $x=\frac{2\pm\sqrt{(-2)^2-4(-9)(11)}}{2(-9)}$

$x=-1.22, 1$

21 a) $(-2)^2-4(1)(-2)$

$4+8$

$12 \Rightarrow$ 2 SOLUTIONS (IRRATIONAL)

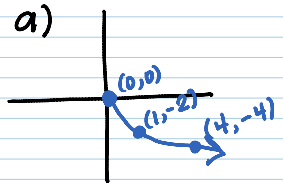
b) $(-4)^2-4(5)(-1)$

$36 \Rightarrow$ 2 SOLUTIONS (RATIONAL)

c) $(-3)^2-4(3)(-4)$

$57 \Rightarrow$ 2 SOL. (RATIONAL)

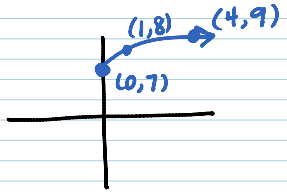
22 a)



D: $[0,\infty)$

R: $(-\infty,0]$

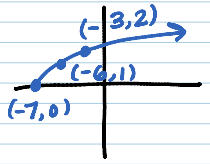
b)



D: $[0,\infty)$

R: $[7,\infty)$

c)



D: $[-7,\infty)$

R: $[0,\infty)$

23 a) $11x\sqrt{x}$

b) $7\sqrt{7x^2}$

$7x\sqrt{7}$

c) $7\sqrt{2}-\sqrt{12}$

$7\sqrt{2}-2\sqrt{3}$

d) $\frac{2\sqrt{5}}{5}$

e) $3\sqrt{2}-\sqrt{64\cdot 2}$

$3\sqrt{2}-8\sqrt{2}=-5\sqrt{2}$

f) $\frac{\sqrt{5}}{x}$

24 a) $\sqrt{x}-28=0$

$\sqrt{x}^2=28^2$

$x=784$ ✓

b) $8\sqrt{x-5}+34=58$

$8\sqrt{x-5}=24$

$\sqrt{x-5}^2=3^2$

$x-5=9$

$x=14$ ✓

c) $\sqrt{5x-3}^2=\sqrt{x+17}^2$

$5x-3=x+17$

$4x=20$

$x=5$ ✓

d) $\sqrt{x}^2=(-36)^2$

$x=1296$ ~~1296~~ no real solution

e) $x=\sqrt{2-x}$

$x^2=2-x$

$x^2+x-2=0$

$(x+2)(x-1)=0$

$x=\cancel{-2}, x=1$