5 questions

Quiz Thursday

Key

Final Exam Review #1

1. Which expression is equivalent to $(x+2)^3(-3x(x-5)?$

A. $x^3-3x^2+15x+8$

B. x^3+3x^2+3x+8

C. $x^3+3x^2+27x+8$

D. $x^3-3x^2+15x-8$

$(X+2)(X+2)(X+2)$

	x	2
x	x^2	2x
2	2x	4

$(x^2+4x+4)(x+2)$

	x^2	4x	4
x	x^3	$4x^2$	4x
2	$2x^2$	8x	8

$X^3+6X^2+12X+8$
$-3X^2+15X$

$X^3+3X^2+27X+8$

2. Which is an equation of a parabola that has a directrix of y = -3 and a focus at (3, -1)?

directrix outside parabola
focus: inside the parabola

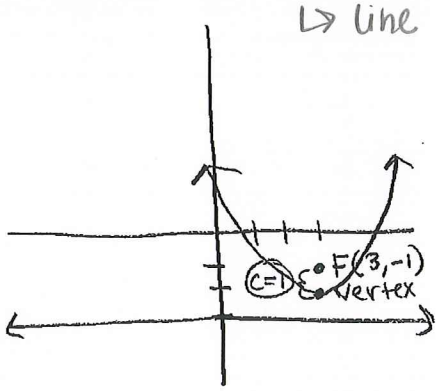
A. $y=\frac{1}{4}(x+3)^2-5$

B. $y=\frac{1}{4}(x-3)^2-2$

C. $y=\frac{1}{4}(x-3)^2+8$

D. $y=\frac{1}{4}(x+3)^2-2$

↳ line



vertex (3, -2)

up = +

$y=\frac{1}{4c}(x-h)^2+k$

$y=\frac{1}{4}(x-3)^2-2$

3. The graph of the function $f(x)=\sqrt{x}$ will be shifted left 4 units and up 23 units. Which is the function that corresponds to the resulting graph?

h = -4 k = 23

A $f(x)=\sqrt{x+4}+23$

B $f(x)=\sqrt{x-4}+23$

C $f(x)=\sqrt{x+4}-23$

D $f(x)=\sqrt{x-4}-23$

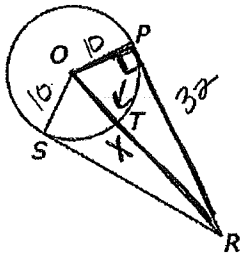
$f(x)=\sqrt{x+4}+23$

↑ opposite

left/right (inside)

up/down (outside on the end)

4. In the figure below, $\overline{PR}$ and $\overline{SR}$ are tangent to circle O.



right ∠

$10^2 + 32^2 = X^2$

$100 + 1024 = X^2$

$1124 = X^2$

$X = 33.53$

→ RADIUS

If OT = 10 cm and PR = 32 cm, what is the length of $\overline{OR}$?

A. 30.40 cm

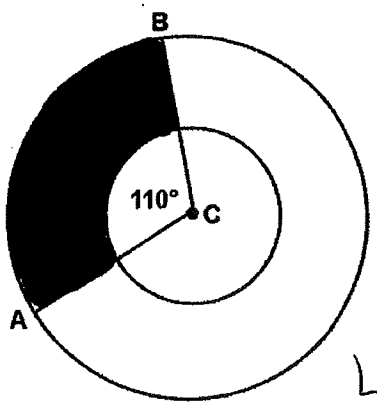
B. 43.17 cm

C. 32 cm

D. 33.53 cm

5. In the figure below, the larger circle has a radius of 6 cm, and the smaller circle has a radius of 2 cm.

$A = \pi r^2 \cdot \frac{\text{degree}}{360}$ (of the arc)



Lg RADIUS = 6

Sm RADIUS = 2

Lg: $A = \pi(6)^2 \cdot \frac{110}{360} = 34.56$ (110 = angle measure)

What is the approximate area of the shaded region?

A. 34.56 cm^2

B. 3.84 cm^2

C. 30.72 cm^2

D. 38.40 cm^2

Sm: $A = \pi(2)^2 \cdot \frac{110}{360} = 3.84$

$34.56 - 3.84 =$ 30.72

$$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$$ ← Quadratic Formula

6. Which choice shows the solution to the equation $5x^2 + 7x = -6$?

A $\frac{7 \pm i\sqrt{71}}{10}$

B $\frac{-7 \pm \sqrt{71}}{10}$

C $\frac{7 \pm \sqrt{71}}{10}$

D $\frac{-7 \pm i\sqrt{71}}{10}$

$5x^2+7x+6=0$

$a=5 \quad b=7 \quad c=6$

$x = \frac{-7 \pm \sqrt{(7)^2-(4 \cdot 5 \cdot 6)}}{2(5)}$

$= \frac{-7 \pm \sqrt{49-120}}{10} = \frac{-7 \pm \sqrt{-71}}{10}$

$= \frac{-7 \pm i\sqrt{71}}{10}$

7. What value of h is needed to complete the square for the equation $x^2+16x+20=(x-h)^2-44$?

A -8

B 8

C 64

D -64

$\left(\frac{b}{2}\right)^2$

$x^2+16x+20=0$

$x^2+16x+\left(\frac{16}{2}\right)^2 = -20+\left(\frac{16}{2}\right)^2$

$-20+64$

$(x+8)^2=44$

$(x+8)^2-44$

$h=-8$

8. Which expression is equivalent to $\frac{\csc\theta}{\sin\theta+\cos\theta\cot\theta}$?

A $\tan\theta$

B $\cos\theta$

C $\sec\theta$

D 1

* Plug in a # for θ
* Type in denominator 1st, starting with cot.

HONORS:

$= \frac{\csc\theta}{\sin\theta+\cos\theta\left(\frac{\cos\theta}{\sin\theta}\right)}$

$= \frac{\csc\theta}{\sin\theta+\frac{\cos^2\theta}{\sin\theta}} = \frac{\csc\theta}{\frac{\sin^2\theta}{\sin\theta}+\frac{\cos^2\theta}{\sin\theta}}$

$= \frac{\csc\theta}{\frac{1}{\sin\theta}}$

$= \frac{\csc\theta}{1} \cdot \frac{\sin\theta}{1}$

$= \csc\theta(\sin\theta)$

$\frac{1}{\sin\theta}(\sin\theta) = 1$

9. Which expression is equivalent to $(5-4i)^2+(4+2i)$

A $45+2i$

B $13+2i$

C $13-38i$

D $13+38i$

	5	-4i
5	25	-20i
-4i	-20i	$16i^2$

-16

OR use calculator!

$9-40i+4+2i$

$13-38i$

Degrees to Radians
$180 * \frac{\pi}{180}$

Radians to Degrees
$\pi * \frac{180}{\pi}$

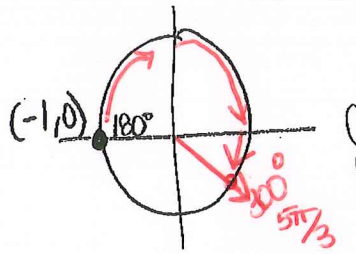
10. William put the tip of his pencil on the outer edge of a graph of the unit circle at the point (-1, 0). He moved his pencil tip through an angle of $\frac{5\pi}{3}$ radians in a clockwise direction along the edge of the circle. At what angle of the unit circle did William's pencil tip stop?

A $\frac{\pi}{3}$ 60°

B $\frac{5\pi}{6}$ 150°

C $\frac{7\pi}{6}$ 210°

D $\frac{4\pi}{3}$ 240°



Clock wise

$\frac{5\pi}{3} \cdot \frac{180}{\pi} = 300$

$180° - 300° = -120°$

$-120° + 360$

$240° \cdot \frac{\pi}{180}$

$= \frac{4\pi}{3}$

300 − 300 = 0, 60

180 + 60 = 240

11. What is the inverse of $f(x) = 7 - 4^x$?

A $f^{-1}(x) = \frac{7-x}{4}$

B $f^{-1}(x) = \frac{\log(7)-x}{\log(4)}$

C $f^{-1}(x) = \frac{\log(7-x)}{\log(4)}$

D $f^{-1}(x) = \frac{\log(7-x)}{4}$

$x = 7 - 4^y$

$\frac{x-7}{-1} = \frac{-4^y}{-1}$

$-x + 7 = 4^y$ ← put in LOG

$\log_4(-x+7) = y$

$\frac{\log(-x+7)}{\log 4}$

12. The volume of a rectangular prism is represented by the expression $(x^3 + 4x^2 - 11x - 30)$. If the length is $(x+2)$, which of the following could be an expression for the width?

A $x-5$

B $x-3$

C $x+3$

D $x-2$

-2	1	4	-11	-30
		+	+	+
	↓	-2	-4	30
	1	2	-15	0

$x^2 + 2x - 15$ FACTOR

$a = 1$, $b = 2$, $c = -15$ → -15: $5 \cdot -3$

$(x+5)(x-3)$

(3)

5 questions for Quiz - Friday -

Answer Key

Final Exam Review #2

1) What is the solution set of the equation $\left(\sqrt{2x-4}\right)^2 = (x-2)^2$?

a. {-2, -4}
b. {2, 4}
c. {4}
d. { }

$2x-4 = (x-2)(x-2)$

$2x-4 = x^2-2x-2x+4$

$2x-4 = x^2-4x+4$

$-2x \quad +4 \quad -2x \quad +4$

$0 = x^2-6x+8$ FACTOR! $\frac{8}{-4,-2}$

$(x-4)(x-2)$

$x=4 \quad x=2$ ✓

Ck:

$\sqrt{2(4)-4} = 4-2$

$\sqrt{4} = 2$ ✓

$\sqrt{2(2)-4} = 2-2$

$0=0$ ✓

2) What is the period of the graph $y = \frac{1}{2}\sin 6x$?

a. $\pi/6$
b. $\pi/3$
c. $\pi/2$
d. 6π

$y = a\sin(bx+c)+d$

$\text{period} = \frac{2\pi}{b}$

$= \frac{2\pi}{6} = \frac{\pi}{3}$

3) What is the solution set of the equation $\frac{30}{x^2-9} + 1 = \frac{5}{x-3}$?

a. {2, 3}
b. {2}
c. {3}
d. { }

get common denominators

$x \neq 3, -3$

$(x+3)(x-3) \quad (x+3)(x-3) \quad (x+3)$

$30 + (x+3)(x-3) = 5(x+3)$

$30 + x^2 - 3x + 3x - 9 = 5x + 15$

$x^2 + 21 = 5x + 15$

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

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

$x=3 \quad x=2$

4) Max solves a quadratic equation by completing the square. He shows a correct step:

$$(x+2)^2 = -9$$

What are the solutions to his equation?

a. $2 \pm 3i$
b. $-2 \pm 3i$
c. $3 \pm 2i$
d. $-3 \pm 2i$

$\sqrt{(x+2)^2} = \pm\sqrt{-9}$

$x+2 = \pm 3i$

$x = -2 \pm 3i$

5) If $g(x) = \frac{1}{2}x + 8$ and $h(x) = \frac{1}{2}x - 2$, what is the value of $g(h(-8))$?

a. 0
b. 9
c. 5
d. 4

$g(-6) = \frac{1}{2}(-6) + 8$

$-3 + 8 = 5$

$h(-8) = \frac{1}{2}(-8) - 2$

$-4 - 2$

$= -6$

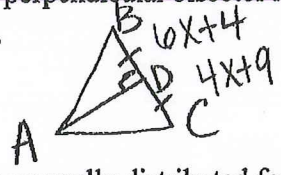
Final Exam Review #3

(Color by Number)

Name: Answer Key

Red

1) Given △ABC with a perpendicular bisector $\overline{AD}$. CD = 4x + 9 and DB = 6x + 4. Find the length of $\overline{CB}$.



$6x+4 = 4x+9$

$2x = 5$

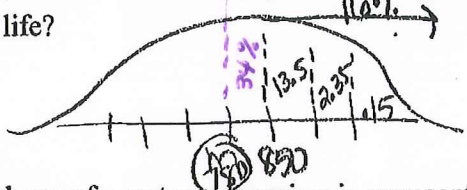
$x = 2.5$

$6(2.5)+4 = 19$

$19(2) = \boxed{38}$

White

2) The battery lifetime is normally distributed for large samples with a standard deviation of 70 days. If 16% of the batteries have a lifetime of 850 or higher, what is the average battery life?



$850 - 70 = \boxed{780}$

68%
95%
99.7%

BLACK

3) The volume of a rectangular prism is represented by the expression $(x^3 + 3x^2 - 10x - 24)$. If the length is $(x + 4)$, and the width is greater than the height, find the width.

−4	1	3	−10	−24
		−4	4	24
	1	−1	−6	0

$x^2 - x - 6$

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

Green

4) Solve for x: $\frac{(2x+1)}{x+1} \cdot \frac{x-3}{(2x+1)} = \frac{2x-3}{2x+1} \cdot \frac{(x+1)}{(x+1)}$

Cross multiply

$(2x+1)(x-3) = (2x-3)(x+1)$

$2x^2 - 6x + x - 3 = 2x^2 + 2x - 3x - 3$

$-5x - 3 = -x - 3$

$-4x = 0$

$\boxed{x = 0}$

yellow

5) Given the circumference of a circle is 40π, find the area of a 60° sector of this circle.

$C = 2\pi r$

$40\pi = 2\pi r$

$r = 20$

$A = \pi(20)^2 \cdot \frac{60}{360} = \boxed{209.44}$

* Area of Sector

$A = \pi r^2 \cdot \frac{deg}{360^\circ}$

Tan

6) Express in degrees an angle of $\frac{2\pi}{15}$ radians.

$\frac{2\pi}{15} \cdot \frac{180}{\pi} = \boxed{24^\circ}$

* Circumference

$C = 2\pi r$

Color by Number Answers:

~~780 (WHITE)~~ ~~x + 2 (BLACK)~~ ~~24 (TAN)~~

~~209.44 (YELLOW)~~ ~~38 (RED)~~ ~~0 (GREEN)~~

***You may color #'s 7-9 any color you wish!**

Monday Quiz

Final Exam Review #4

1. Which expression is equivalent to $(x+6)^3 - 4x(x-2)$?

A. $x^3+18x^2+108x+216$

B. $x^3+14x^2+100x+216$

C. $x^3+14x^2+116x+216$

D. $x^3+22x^2+116x+216$

$-4x^2+8x$

$(x+6)(x+6)(x+6)$

	x	6
x	x^2	6x
6	6x	36

$(x^2+12x+36)(x+6)$

	x^2	12x	36
x	x^3	$12x^2$	36x
6	$6x^2$	72x	216

$x^3+18x^2+108x+216$
$-4x^2+8x$

2. Suppose $p(x) = x^3 - 5x^2 - 8x + k$. The remainder of the division of $p(x)$ by $(x-2)$ is -24. What is the remainder of the division of $p(x)$ by $(x+3)$? **(A.APR.2/6)**

A. 44

B. -25

C. -44

D. -35

2	1	-5	-8	K
	↓	2	-6	-28
	1	-3	-14	-24

$K+-28=-24$

$K=4$

-3	1	-5	-8	4
	↓	-3	24	-48
	1	-8	16	-44

start

3. In 2004, Samantha wanted to invest some money into an account that would earn 4.36% interest, compounded continuously. What is the earliest year in which the value of her account would be at least doubled? **(F.BF.1/F.LE.3)**

A. 2005 $t=1$ $100e^{(.046)(1)} = 104.7$

B. 2014 $t=10$ $100e^{(.046)(10)} = 158.41$

C. 2020 $t=16$ $100e^{(.046)(16)} = 208.$

D. 2030 $t=26$

$100e^{.0436t}$

Pert formula

$A = Pe^{rt}$ → Pick any starting amount (P)

$y = 100e^{(.046)(x)}$

2004 + 16 = 2020

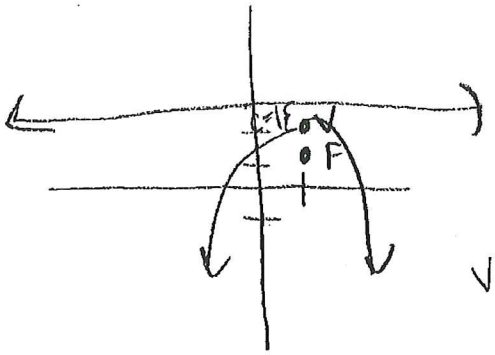
4. Which is an equation of a parabola that has a directrix of y = 3 and a focus at (1, 1)? **(G.GPE.2)**

A. $y = \frac{1}{4}(x+1)^2 - 2$

B. $y = \frac{1}{-4}(x+1)^2 + 2$

C. $y = \frac{1}{-4}(x-1)^2 + 2$

D. $y = \frac{1}{4}(x-1)^2 + 2$



down = −

vertex (1, 2)

$y = \frac{1}{-4}(x-1)^2 + 2$

standard form vertex

graph & find the vertex (h,k)

5. What value of h is needed to complete the square for the equation $x^2+8x+32=(x-h)^2+16$? **(A.REI.4a)**

A 8

B 4

C -4

D 16

$x^2+8x+32=0$

$x^2+8x+\left(\frac{8}{2}\right)^2=-32+\left(\frac{8}{2}\right)^2$

$(x+4)^2=-16$

$(x+4)^2+16$ $\quad h=-4$

6. Which expression is equivalent to $\frac{\cos\theta\sec\theta}{\tan\theta\csc\theta}$? **(F.TF.8)**

A $\cos\theta$

B $\tan\theta$

C 1

D $\sec\theta$

$\cos\left(\frac{1}{\cos}\right)=1$

$\left(\frac{\sin}{\cos}\right)\left(\frac{1}{\sin}\right)=\frac{1}{\cos}=\sec$

$\frac{1}{\sec}=\cos\theta$

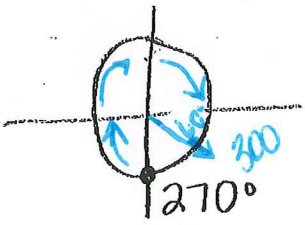
7. William put the tip of his pencil on the outer edge of a graph of the unit circle at the point (0, -1). He moved his pencil tip through an angle of $\frac{5\pi}{3}$ radians in a clockwise direction along the edge of the circle. At what angle of the unit circle did William's pencil tip stop? **(F.TF.2)**

A $\frac{\pi}{6}$ 30°

B $\frac{11\pi}{6}$ 330°

C $\frac{7\pi}{6}$ 210°

D $\frac{4\pi}{3}$ 240°



(0,-1)

$\frac{5\pi}{3}\cdot\frac{180}{\pi}=300°$

180 +90 +60

$270°-300°=-30°$

$+360$

$330°\cdot\frac{\pi}{180}=\frac{11\pi}{6}$

8. What is the inverse of $f(x)=5-2^x$? **(F.BF.4a)**

A $f^{-1}(x)=\frac{5-x}{2}$

B $f^{-1}(x)=\frac{\log(5)-x}{\log(2)}$

C $f^{-1}(x)=\frac{\log(5-x)}{\log(2)}$

D $f^{-1}(x)=\frac{\log(5-x)}{2}$

$x=5-2^y$

$x-5=-2^y$

$-x+5=2^y$

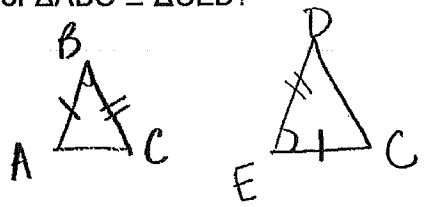
$\log_2(-x+5)=y$

$\frac{\log(-x+5)}{\log 2}=y$

Final Exam Review #5

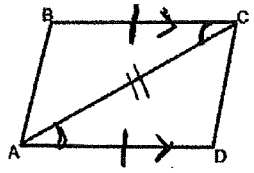
1) Given ΔABC and ΔEDC, with $\overline{AB} \cong \overline{EC}$, m<ABC ≅ m<CED, and $\overline{BC} \cong \overline{ED}$. Which of the following is the reason for ΔABC ≅ ΔCED?

a. Side-Side-Angle Postulate
b. Angle-Angle-Side Postulate
c. Side-Side-Side Postulate
d. Side-Angle-Side Postulate



2) Fill in the (1) and (2) blanks of the two column proof.

Given: $\overline{BC} \cong \overline{DA}$; $\overline{BC} \parallel \overline{AD}$
Prove: $\Delta ABC \cong \Delta CDA$



Statements	Reasons
1. $\overline{BC} \cong \overline{DA}$; $\overline{BC} \parallel \overline{AD}$	1. Given
2. $\overline{AC} \cong \overline{AC}$	2. _____(1) reflexive
3. <BCA ≅ <CAD	3. Alternate interior angles are congruent
4. $\Delta ABC \cong \Delta CDA$	4. _____(2) SAS

a. (1) = reflexive property ; (2) = SSA
b. (1) = alternate interior angles; (2) = SAS
c. (1) = reflexive property; (2) = SAS
d. (1) = symmetric property; (2) = ASA

3) You want to paint a wall that is in the shape of a rhombus. The wall has diagonals that are 5 meters and 15 meters. Deelux Matt Emulsion paint costs $7.50 per meter square. How much will it cost to paint this rhombus-shaped wall?

a. $75
b. $562.50
c. $281.25
d. $140.63

$\frac{1}{2}(5)(15) = 37.5(\$7.50)$

4) What are the radius and the coordinates of the center for the equation $(x + 2)^2 + (y - 5)^2 = 100$.

a. center: (2, -5); radius = 100
b. center: (-2, 5); radius = 100
c. center: (2, -5); radius = 10
d. center: (-2, 5); radius = 10

center (-2, 5) r = 10

$\frac{1}{4C} = \frac{2}{1}$

$1 = 8C \quad C = \frac{1}{8} = .125$

vert $(-6, 3)$

5) A boomerang follows the trajectory of a parabola with the equation $y = 2(x + 6)^2 + 3$. What is the focus of this parabola?

a. (-6, 3)

b. (-6, 11)

c. (-6, 3.125)

d. (-3, 6)

focus $(-6, 3 + .125)$

$r = 8$

6) If the equation of a circle is given by $(x + 6)^2 + (y - 3)^2 = 64$, what is the approximate length of a 80° sector?

a. 8
b. 201.1
c. 44.7
d. 11.2

$L = 2\pi(8) \cdot \frac{80}{360}$

7) If $f(-1) = -5$ and $f(2) = 1$, which of the following must be the function?

a. $f(x) = x^2 - 6$ $(-1)^2 - 6 = -5$ $(2)^2 - 6 = -2$

b. $f(x) = x^2 - 7$ $(-1)^2 - 7 = -6$

c. $f(x) = 2x - 3$ $2(-1) - 3 = -5$ $2(2) - 3 = 1$

d. $f(x) = 9x + 20$

8) A system of equations is shown below.

$y = |x - 3|$

$y = \frac{1}{2}x$

What is the distance between the points of intersection of the system?

(2, 1) (6, 3)

a. $\sqrt{6}$
b. $\sqrt{20}$
c. $\sqrt{48}$
d. $\sqrt{80}$

$d = \sqrt{(2-6)^2 + (1-3)^2}$

$= \sqrt{16 + 4} = \sqrt{20}$

9) A function is shown below.

$$f(x) = \begin{cases} x + 2, & x < -1 \\ x^2, & -1 \le x \le 2 \\ 3x, & x > 2 \end{cases}$$

$-5 + 2$ 2^2 $3(7)$

What is the value of the expression $f(2) + 2f(-5) - f(7)$?

$4 + 2(-3) - 21 = -23$

a. -15
b. -45
c. -19
d. -23

10) Let $f(x) = 14x^3 + 28x^2 - 46x$ and $g(x) = 2x + 7$. What is the solution set to the equation $\frac{1}{12}f(x) = g(x)$?

intersect x-value

a. {-3, 0, 1}
b. {-3, -1, 2}
c. {-2, 1, 3}
d. {1, 5, 11}

$Y_1 = \left(\frac{1}{12}\right)(14X^3 + 28X^2 - 46X)$

$Y_2 = 2X + 7$

-3 -1 2

4 questions for quiz

Quiz Wednesday M3

Key

Final Exam Review #6

1. Simplify $x^2 + 3x^3 - (2x^2 + 1)$.

a. $3x^3 - x^2 - 1$
b. $3x^3 - x^2 + 1$
c. $3x^3 + x^2 - 1$
d. $3x^3 + x^2 + 1$

$x^2 + 3x^3 - 2x^2 - 1$

$3x^3 - x^2 - 1$

2. Simplify $(6x^3 + 8x - 10) \div (2x - 2)$ using long division.

a. $6x^2 + 12x + 32 + \frac{54}{2x-2}$
b. $3x + 7 + \frac{4}{2x-2}$
c. $6x^2 - 12x - 4 + \frac{2}{2x-2}$
d. $3x^2 + 3x + 7 + \frac{4}{2x-2}$

$\frac{6x^3}{2x} = 3x^2$

$\frac{6x^2}{2x} = 3x$

$\frac{14x}{2x} = 7$

$3x^2 + 3x + 7 + \frac{4}{2x-2}$

$2x-2 \overline{)6x^3 + 0x^2 + 8x - 10}$

$-6x^3 + 6x^2$

$6x^2 + 8x$

$-6x^2 + 6x$

$14x - 10$

$-14x + 14$

4

3. What is the equation of a polynomial with zeros $x = 2$, $x = -3$, and $x = 1$?

a. $x^3 - 5x^2 - 2x^2 - 6$
b. $x^3 - 2x^2 - 5x + 6$
c. $x^3 - 7x + 6$
d. $x^3 - 2x^2 + 5x + 6$

$(x-2)(x+3)(x-1)$

$x^2 + 3x - 2x - 6$

$(x^2 + x - 6)(x - 1)$

	x^2	x	-6
x	x^3	x^2	$-6x$
-1	$-x^2$	$-x$	6

$x^3 - 7x + 6$

equation of a circle

4. Describe the transformation of $x^2 + y^2 = 9$ to $(x + 2)^2 + (y - 3)^2 = 9$.

a. Right 2, Down 3
b. Left 2, Up 3
c. Left 2, Down 3
d. Right 2, Up 3

$(-2, 3)$

left 2 up 3

Rational function

5. Simplify and state the restrictions: $\frac{x^2-4}{x^2+6x+9} \div \frac{x^2+4x+4}{x^2-9}$

a. $\frac{(x-2)(x-3)}{(x+3)(x+2)}; x \neq -3, -2, 3$
b. $\frac{(x-2)(x-3)}{(x+3)}; x \neq -3,$
c. $\frac{(x-2)(x+2)}{(x+3)(x-3)}; x \neq -3, 3$
d. $\frac{(x-2)(x+2)}{(x+3)(x-3)}; x \neq -3, -2, 3$

same change flip

$\frac{x^2-4}{x^2+6x+9} \cdot \frac{x^2-9}{x^2+4x+4}$

$\frac{(x+2)(x-2)}{(x+3)(x+3)} \cdot \frac{(x+3)(x-3)}{(x+2)(x+2)} = \frac{(x-2)(x-3)}{(x+3)(x+2)}$

$x \neq -3, -2, 3$

① factor ② get common denominator ③ add numerators ④ Restrictions come from denominators

6. Simplify and state the restrictions: $\frac{x-1}{x^2+6x+5}+\frac{-x}{x+5}$

a. $\frac{-1}{x+5}; x \neq -5, -1$

b. $\frac{-x^2-1}{(x+5)(x+1)}; x \neq -5, -1$

c. $\frac{-1}{(x+5)(x+1)}; x \neq -5, -1$

d. $\frac{-x^2-1}{x+5}; x \neq -5, -1$

Rational function

$(x+5)(x+1)$ $(x+1)$

$\frac{x-1}{(x+5)(x+1)}+\frac{-x^2-x}{(x+5)(x+1)} = \frac{-x^2-1}{(x+5)(x+1)}$

$x \neq -5, -1$

7. Solve for x: $\frac{2}{x+2}+\frac{3}{x^2+5x+6}=\frac{1}{x+3}$ $(x+3)(x+2)$

a. x = 3

b. x = -4

c. x = -7

d. no solution

Rational function

$2x+6+3 = x+2$

$2x+9 = x+2$

$x = -7$

$x \neq -3, -2$

8. Simplify $\frac{2+3i}{6+7i} \cdot \frac{6-7i}{6-7i} = \frac{12-14i+18i-21i^2}{36-42i+42i-49i^2} = \frac{33+4i}{85}$ $i^2 = -1$

Calculator

parentheses top & bottom

a. $\frac{8}{13}$

b. $\frac{33}{85}$

c. $\frac{33+4i}{13}$

d. $\frac{33+4i}{85}$

Same as $\frac{33}{85}+\frac{4}{85}i$

9. Write $y = x^2 - 16x + 3$ in vertex form.

a. $y = (x-8)^2 - 67$

b. $y = (x-4)^2 - 1$

c. $y = (x-16)^2 + 3$

d. $y = (x-8)^2 - 61$

Calculator

graph

a → stays the same

$(h, k) \rightarrow (x, y)$

$x^2 - 16x + 3 = 0$

$x^2 - 16x = -3$

$x^2 - 16x + \left(\frac{16}{2}\right)^2 = -3 + \left(\frac{-16}{2}\right)^2$

$(x-8)^2 = 61$

$(x-8)^2 - 61$

10. State the center and radius of the circle: $x^2 + y^2 + 8x - 6y - 11 = 0$.

a. C = (-4, 3), r = 6

b. C = (4, -3), r = 6

c. C = (8, -6), r = 11

d. C = (-4, 3), r = 36

equation of a circle

$x^2 + 8x + y^2 - 6y = 11$

→ complete the square

$(x^2 + 8x + \left(\frac{8}{2}\right)^2) + (y^2 - 6y + \left(\frac{-6}{2}\right)^2) = 11 + \left(\frac{8}{2}\right)^2 + \left(\frac{-6}{2}\right)^2$

$(x+4)^2 + (y-3)^2 = 36$

C(-4, 3) r = 6

$x^2 + 8x + 16 + y^2 - 6y + 9 = 36$

$x^2 + 8x + y^2 - 6y = 11$