from the Prerequisite Review Worksheet: 5, 7, 8, 9,, 15, 16, 17, 22,
Plus the Factoring Worksheet

Simplify the expression. Express the answer so that all exponents are positive. Whenever an exponent is 0 or negative, we assume that the base is not 0.

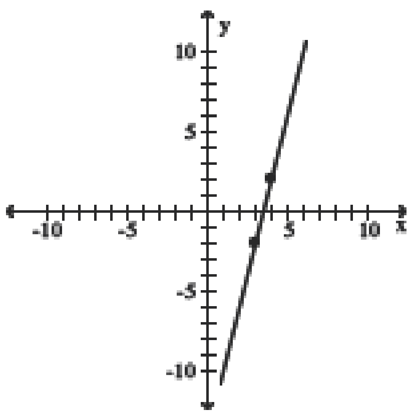
1) $\left(\dfrac{-4x^2y^{-2}}{7z^3}\right)^{-2}$

Perform the indicated operations and simplify the result. Leave the answer in factored form.

2) $\dfrac{x^2+14x+45}{x^2+15x+54} \cdot \dfrac{x^2+13x+42}{x^2+12x+35}$

Find the equation of the line in slope-intercept form.

3)



Find the distance $d(P_1, P_2)$ between the points P_1 and P_2.

4) $P_1 = (1, 4)$; $P_2 = (-5, -4)$

Find the midpoint of the line segment joining the points P_1 and P_2.

5) $P_1 = (9, 4)$; $P_2 = (2, 3)$

Find an equation for the line, in the indicated form, with the given properties.

6) Containing the points $(-8, -5)$ and $(-4, -8)$; slope-intercept form

Simplify the expression. Assume that all variables are positive when they appear.

7) $\dfrac{6}{8-\sqrt{3}}$

Perform the indicated operations and simplify the result. Leave the answer in factored form.

8)
$$\frac{\frac{2}{x+3}+\frac{4}{x+7}}{\frac{3x+13}{x^2+10x+21}}$$

Factor Completely:

9) $21x^4 - 45x^3 + 24x^2$

10. $4(x-y)^2 - 9z^2$

11. $x^3 - 4x^2 - 5x + 20$

12. $81x^4 - 16$

List the intercepts and type(s) of symmetry, if any.

13) $y = \frac{-x}{x^2 - 1}$

Write the standard form of the equation of the circle with radius r and center (h, k).

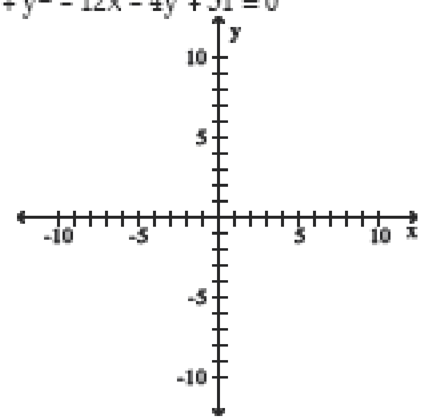
14) $r = 8$; $(h, k) = (5, 7)$

Find the center (h, k) and radius r of the circle with the given equation.

15) $(x + 10)^2 + (y + 4)^2 = 64$

Find the center (h, k) and radius r of the circle. Graph the circle.

16) $x^2 + y^2 - 12x - 4y + 31 = 0$



Solve the equation.

17) $\frac{4}{x+2} - \frac{6}{x-2} = \frac{14}{(x+2)(x-2)}$

1) $\frac{49y^4z^6}{16x^4}$

2) 1

3) $y = 4x - 14$

4) 10

5) $\left(\frac{11}{2}, \frac{7}{2}\right)$

6) $y = -\frac{3}{4}x - 11$

7) $\frac{48 + 6\sqrt{3}}{61}$

8) 2

9) $3x^2(7x-8)(x-1)$

10) $(2x-2y-3z)(2x-2y+3z)$

11) $(x^2-5)(x-4)$

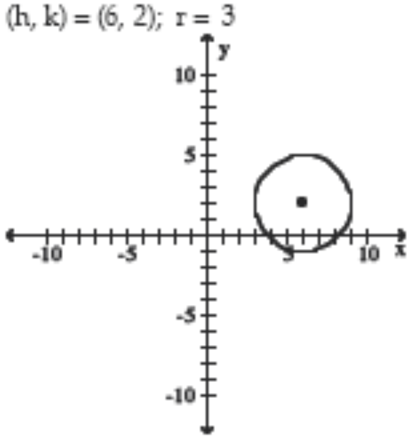
12) $(9x^2+4)(3x-2)(3x+2)$

13) intercept: (0, 0)
symmetric with respect to origin

14) $(x - 5)^2 + (y - 7)^2 = 64$

15) $(h, k) = (-10, -4)$; $r = 8$

16) $(h, k) = (6, 2)$; $r = 3$



17) {-17}

Key A+F Review Page 1

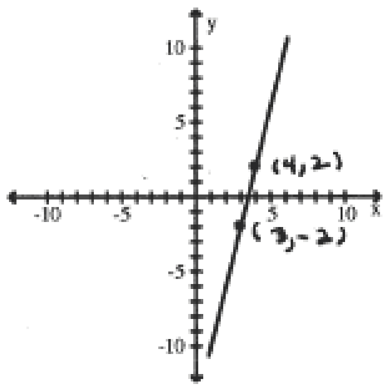
① $\left[\dfrac{(-4)^1 x^2 y^{-2}}{7^1 z^3}\right]^{-2} = \dfrac{(-4)^{-2} x^{-4} y^4}{7^{-2} z^{-6}}$

$= \dfrac{7^2 y^4 z^6}{(-4)^2 x^4} = \dfrac{49 y^4 z^6}{16 x^4}$

② $\dfrac{(\cancel{x+9})(\cancel{x+5})}{(\cancel{x+9})(\cancel{x+6})} \cdot \dfrac{(\cancel{x+6})(\cancel{x+7})}{(\cancel{x+7})(\cancel{x+5})} = 1$

Find the equation of the line in slope-intercept form.

3)



$m = \dfrac{y_2 - y_1}{x_2 - x_1} = \dfrac{2 - {}^-2}{4-3} = \dfrac{4}{1} = 4$ $(4,2)$

$(y - y_1) = m(x - x_1)$

$\boxed{(y-2) = 4(x-4)}$

$y - 2 = 4x - 16$

$y = 4x - 14$

Find the distance $d(P_1, P_2)$ between the points P_1 and P_2.

4) $P_1 = (1, 4)$; $P_2 = (-5, -4)$

$d = \sqrt{(-5-1)^2 + (-4-4)^2}$
$= \sqrt{(-6)^2 + (-8)^2} = \sqrt{36+64}$
$= \sqrt{100} = 10$

Find the midpoint of the line segment joining the points P_1 and P_2.

5) $P_1 = (9, 4)$; $P_2 = (2, 3)$

$(x_m, y_m) = \left(\dfrac{9+2}{2}, \dfrac{4+3}{2}\right) = \left(\dfrac{11}{2}, \dfrac{7}{2}\right)$

Find an equation for the line, in the indicated form, with the given properties.

6) Containing the points $(-8, -5)$ and $(-4, -8)$; slope-intercept form

⑥ $m = \dfrac{-8 - {}^-5}{-4 - {}^-8} = \dfrac{-3}{4}$; $(-4, -8)$

$(y - {}^-8) = -\frac{3}{4}(x - {}^-4)$

$(y+8) = -\frac{3}{4}(x+4)$

$y + 8 = -\frac{3}{4}x - 3$

$\boxed{y = -\frac{3}{4}x - 11}$

Simplify the expression. Assume that all variables are positive when they appear.

7) $\frac{6}{(8-\sqrt{3})} \cdot \frac{(8+\sqrt{3})}{(8+\sqrt{3})} = \frac{6(8+\sqrt{3})}{64-\sqrt{9}} = \frac{48+6\sqrt{3}}{64-3}$

$= \frac{48+6\sqrt{3}}{61}$

(8) $\left[\frac{\frac{2}{x+3}+\frac{4}{x+7}}{\frac{3x+13}{(x+3)(x+7)}}\right] \frac{\frac{(x+3)(x+7)}{1}}{\frac{(x+3)(x+7)}{1}}$

$= \frac{2(x+7)+4(x+3)}{3x+13}$

$= \frac{2x+14+4x+12}{3x+13} = \frac{6x+26}{3x+13}$

$= \frac{2(3x+13)}{3x+13} = 2$

9+10 see answer

(11) $(x^3-4x^2)-(5x+20)$ ← grouping

$x^2(x-4)-5(x-4)$

$(x-4)(x^2-5)$ ←

(12) $81x^4-16$ ← difference of squares

$9x^2 \quad 4$

$(9x^2+4)(9x^2-4)$

$3x \quad 2$

$(9x^2+4)(3x-2)(3x+2)$ ←

13) $y = \frac{-x}{x^2-1}$

X-Int: $y=0$ | y-Int: $x=0$

$0 = \frac{-x}{x^2-1}$

$0 = -x$

$0 = x$

$(0,0)$

$y = \frac{-0}{0^2-1} = \frac{0}{-1} = 0$

$(0,0)$

Symmetry x-axis
$(x,y) \to (x,-y)$

$-y = \frac{-x}{x^2-1}$ not same

No!

y-axis
$(x,y) \to (-x,y)$

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

$y = \frac{x}{x^2-1}$ not same

No!

origin
$(x,y) \to (-x,-y)$

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

$(-y) = \left(\frac{x}{x^2-1}\right)$

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

same Yes

Write the standard form of the equation of the circle with radius r and center (h, k).

14) $r = 8$; $(h, k) = (5, 7)$

$(x-h)^2 + (y-k)^2 = r^2$

$(x-5)^2 + (y-7)^2 = 8^2$ or $(x-5)^2 + (y-7)^2 = 64$

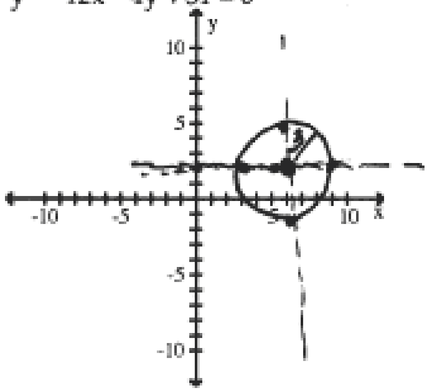
Find the center (h, k) and radius r of the circle with the given equation.

15) $(x + 10)^2 + (y + 4)^2 = 64$

C: $(-10, -4)$ r: $\sqrt{64} = 8$

Find the center (h, k) and radius r of the circle. Graph the circle.

16) $x^2 + y^2 - 12x - 4y + 31 = 0$



Complete the square:

$x^2 - 12x + 36 + y^2 - 4y + 4 = -31 + 36 + 4$

$(x-6)^2 + (y-2)^2 = 9$

C: $(6, 2)$ R: $\sqrt{9} = 3$

$\left(\frac{b}{2}\right)^2 = \left(\frac{-12}{2}\right) = (-6)^2 = 36$

$\left(\frac{-4}{2}\right)^2 = (-2)^2 = 4$

(17) $\left[\frac{4}{x+2} - \frac{6}{x-2}\right] = \left(\frac{14}{(x+2)(x-2)}\right)(x+2)(x-2)$

$4(x-2) - 6(x+2) = 14$

$4x - 8 - 6x - 12 = 14$

$-2x - 20 = 14$

$-2x = 34$

$x = -17$