[P1-9-05-09-21]
Fractions

Exercises [B]

Simplify:

1. $\left(x-\frac{2}{x+1}\right)\left(1-\frac{1}{x+2}\right)$

2. $(y^2-1)\left(\frac{1}{y-1}-\frac{1}{y+1}+2\right)$

3. $\dfrac{\frac{1}{x}+y}{1-xy}-\dfrac{\frac{1}{x}-y}{1+xy}$

4. $\left(\frac{1}{a^2}-\frac{1}{b^2}\right)\div\left(\frac{1}{a}-\frac{1}{b}\right)$

5. $\left(c-2+\frac{1}{c}\right)-\left(\frac{1-c^2}{3c^2+3c}\right)$

6. $\dfrac{\frac{2a}{a^2-1}-\frac{1}{a}}{1+\frac{2}{a^2-1}}$

7. $\dfrac{\frac{x+y}{xy-1}-\frac{1}{y}}{1+\frac{x+y}{y(xy-1)}}$

Exercises [C]

Simplify:

1. $\left[\frac{1}{p(p-1)}+\frac{1}{p(p+1)}\right]\div\left[\frac{1}{p^2-1}-\frac{1}{p^2+1}\right]$

2. $\left(\frac{x}{a}-\frac{x+b}{a+b}\right)\div\left(\frac{x-b}{a-b}-\frac{x}{a}\right)$

3. $\left(\frac{1}{3}+\frac{1}{3x}-\frac{2}{3x^2}\right)\left(x-1-\frac{2}{x}\right)\div\left(1-\frac{5}{x^2}+\frac{4}{x^4}\right)$

4. $\left(\frac{x}{x-y}-\frac{x}{x+y}\right)\div\left(\frac{y}{x+y}+\frac{x^2+y^2}{x^2-y^2}\right)$

5. $\left(x+\frac{1}{x+1}-1\right)\left(x+\frac{1}{x}+2\right)\div\left(x-\frac{1}{x}\right)$

6. $\left(\frac{y+2}{y-1}-\frac{y}{y+3}\right)\div\left(3y-3+\frac{12}{y+3}\right)$

7. $\left(\frac{2}{y}-\frac{1}{x+y}+\frac{1}{x-y}\right)\div\left(\frac{x+y}{x-y}-\frac{x-y}{x+y}\right)$

8. $\dfrac{\frac{c+3}{c-3}-\frac{c-3}{c+3}-2}{\frac{c-3}{c+3}-\frac{c+3}{c-3}-2}$

9. $\dfrac{\frac{r}{s-r}-\frac{r}{s+r}}{\frac{r^2}{r^2+s^2}-\frac{r^2}{r^2-s^2}}$

10. $\left(1-\frac{b^2+c^2-a^2}{2bc}\right)\div\left(1-\frac{a^2+b^2-c^2}{2ab}\right)$

11. $\dfrac{\frac{2}{2x+1}-\frac{1}{2x}}{1+\frac{2x}{1-4x}}\div\dfrac{\frac{2}{2x+1}-1}{2x+\frac{x}{x-1}}$

Exercises [A]

Solve for x in problems 1 to 4

1. $\frac{x}{c}+d=\frac{x}{d}+c$
2. $\frac{p}{x+a}=\frac{q}{x+b}$
3. $a=\frac{2-3x}{x+3}$
4. $a=\frac{c}{x+y}$
5. If $p=2q$, find the value of (a) $\frac{3p-q}{p+q}$; (b) $\frac{2p^2-q^2}{p^2-q^2}$.
6. If $\frac{p}{q}=4$, find the value of (a) $\frac{3p-q}{4p-3q}$; (b) $\frac{2p^2-pq}{p^2-2pq}$
7. If $\frac{3}{x+y}=\frac{4}{x+2y}$, find the ratio of x to y
8. If $\frac{x+2}{y+1}=\frac{x+4}{y+2}$, find the ratio of x to y

Exercises [B]

Solve for x in problems 1 to 8

1. $\frac{1}{x-3c}+\frac{1}{x-4c}=\frac{2}{x-5c}$
2. $\frac{1+x}{1-x}=\frac{1+p}{1-p}$
3. $\frac{1}{f}=(n-1)\left(\frac{1}{x}-\frac{1}{r}\right)$
4. $a=b\left(\frac{c}{x+y}-1\right)$
5. $\frac{x-a}{a+b}+\frac{x-b}{a-(-b)}=1$
6. $\frac{3}{x-p}+\frac{2}{x-q}=\frac{5}{x}$
7. $\frac{a}{a-x}+\frac{b}{b-x}=2$
8. $\frac{1}{x}=\frac{1}{p+q}-\frac{1}{p-q}$
9. If $\frac{x}{y}=z$, express $\frac{3x+2y}{x-3y}$ in terms of z only
10. If $z=\frac{1+x}{1-x}$, find z in terms of y if $x=\frac{1}{y+1}$
11. If $\frac{1}{d}+\frac{1}{i}=\frac{1}{f}$ and $\frac{1}{x}+\frac{1}{2i}=\frac{1}{f}$, find x in terms of d and f
12. A machine that can do a certain job in d days is used for x days on the job ($x<d$), and then breaks down, and the work has to be finished on another machine that would take c days to do the whole job How many days would it take the second machine to finish the job?