

1. Simplify the expression.  $(3\gamma^3 \cdot u^4)^4(-3\gamma^3 \cdot u^2)^2$

A.  $72\gamma^{18}u^{20}$

B.  $1458\gamma^{72}u^{64}$

C.  $-9\gamma^{12}u^{12}$

D.  $729\gamma^{18}u^{20}$

E.  $18\gamma^{18}u^{20}$

F.  $-9\gamma^{18}u^{20}$

G.  $729\gamma^{12}u^{12}$

H.  $9\gamma^{72}u^{64}$

2. Simplify the expression.  $\left(\frac{v^6}{v^4}\right)^5$

A.  $v^7$

B.  $v^{-1}$

C.  $24v^{10}$

D.  $24v^{24}$

E.  $v^{10}$

F.  $24v$

G.  $2v$

H.  $v^{50}$

3. Simplify the expression.  $\left(\frac{2\xi^9 r^8}{12\xi^5 r^4}\right)\left(\frac{4\xi^9 r^8}{8\xi^3 r^2}\right)$

A.  $\frac{1}{12\xi^4 r^4}$

B.  $\frac{1}{12}(\xi r)^8$

C.  $\frac{1}{12}\xi^{10} r^{18}$

D.  $\frac{1}{12\xi^{14} r^{12}}$

E.  $\frac{1}{12}\xi^{14} r^{12}$

F.  $\frac{1}{12}\xi^{10} r^{10}$

G.  $\frac{\xi^4}{12r^4}$

H.  $\frac{1}{12}\xi r^8$

4. Simplify the expression.  $\frac{(\xi^{-4} \cdot q^{-3})^{-7} (\xi^{-8} \cdot q^6)^3}{(\xi^{-5} \cdot q^{-6})^{-2}}$

A.  $\xi^{-6} q^{27}$

B.  $\xi^{-11} q^{22}$

C.  $\xi^{-24} q^9$

D.  $q^{33}$

E.  $\xi^{-12} q^{21}$

F.  $\xi^{-9} q^{24}$

G.  $\xi^3 q^{36}$

H.  $\xi^{14} q^{47}$

5. Simplify the expression.  $(\gamma^{14} \cdot z^{-15})^5$

A.  $\gamma^{70}z^{-75}$

B.  $\gamma^{-61}z^{84}$

C.  $\gamma^{82}z^{-63}$

D.  $\gamma^{14}z^{-15}$

E.  $\gamma^{22}z^{-7}$

F.  $\gamma^{-84}z^{61}$

G.  $\gamma^{-38}z^{-9}$

H.  $\gamma^{-34}z^{-5}$

6. Subtract the polynomials.  $(-7y^2 + y - 3) - (7y^3 - 4y^2 + 4y + 3)$

A.  $-7y^3 - 3y^2 + y - 6$

B.  $-8y^3 - 3y^2 - 3y - 6$

C.  $3y^4 - 1y^3 - 14y^2 - 3y - 6$

D.  $3y^4 + y^3 - 3y^2 - 3y - 6$

E.  $-7y^3 - 5y^2 - 3y - 6$

F.  $-7y^3 - 3y^2 - 3y - 6$

G.  $-7y^3 - 3y^2 - 3y - 5$

H.  $-3y^4 - 7y^3 - 3y^2 - 3y - 6$

7. Multiply the polynomials.  $(-\phi + 6)(-7\phi + 5)$

A.  $7\phi^2 - 47\phi + 33$

B.  $7\phi^2 - 53\phi + 30$

C.  $13\phi^2 - 47\phi + 30$

D.  $4\phi^3 + 7\phi^2 - 47\phi + 30$

E.  $7\phi^2 - 47\phi + 30$

8. Multiply the polynomials.  $(-3w^2 - 9w)(-5)$

A.  $2w^3 + 15w^2 + 45w$

B.  $15w^2 + 45w$

C.  $9w^2 + 45w$

D.  $15w^2 + 42w$

E.  $15w^2 + 45w - 1$



9. Multiply the polynomials.  $(6t + 7)(6t - 7)$

A.  $36t^2 - 84t + 49$

B.  $36t^2 - 49$

C.  $36t^2 + 84t - 49$

D.  $36t^2 + 49$

E.  $49t^2 - 36$

10. Expand the square.  $(3v^2 - 1)^2$

A.  $9v^4 + 1$

B.  $9v^4 + 6v^2 - 1$

C.  $9v^4 - 6v^2 - 1$

D.  $9v^4 - 1$

E.  $9v^4 - 6v^2 + 1$

11. Factor out the GCF.  $14p + 18p^9 - 9p^2$

A.  $4p^3(4p^4 + 3p^5 - 4)$

B.  $p^5(p^2 + 3 - p^2)$

C.  $p^3(4p^5 + 4 - p)$

D.  $3p^3(4p^4 + 3p^5 - 4)$

E.  $3p^4(3 + p - 2p^2)$

F.  $3p(3 + p^4 - 2p^2)$

G.  $p(14 + 18p^8 - 9p)$

H.  $p^4(3p^5 + 4 - p^5)$

12. Factor the following quadratic polynomial.  $t^2 - 15t + 50$

A.  $(t + 4)(t + 9)$

B.  $(t - 5)(t - 10)$

C.  $(t + 3)(t + 7)$

D.  $(t + 5)(t + 10)$

E.  $(t + 3)(t - 7)$

F. Not factorable. This trinomial is prime.

G.  $(t - 4)(t + 9)$

H.  $(t - 5)(t + 10)$

13. Factor the following quadratic polynomial.  $5z^2 - 12z - 8$

A.  $(5z - 1)(z + 8)$

B.  $(5z + 1)(z - 8)$

C.  $(5z - 8)(z - 8)$

D.  $(5z + 2)(z + 4)$

E. Not factorable. This trinomial is prime.

F.  $(5z - 4)(z - 4)$

G.  $(5z - 2)(z + 4)$

H.  $(5z + 1)(z + 8)$

14. Factor the following quadratic polynomial.  $-15t^2 + 26t - 8$

A.  $(5t - 1)(3t + 8)$

B.  $(15t + 2)(t - 4)$

C.  $-(5t - 2)(3t - 4)$

D.  $(5t + 1)(3t - 8)$

E.  $-(5t + 2)(3t - 4)$

F.  $-(15t - 2)(t + 4)$

G. Not factorable. This trinomial is prime.

H.  $-(5t - 2)(3t + 4)$

15. Factor the polynomial.  $16a^2 - 25$

A.  $(4a - 5)(4a - 5)$

B. Not factorable.

C.  $(16a + 5)(4a + 25)$

D.  $(4a + 5)(4a + 5)$

E.  $(4a + 5)(4a - 5)$

F.  $(5a + 2)(8a + 3)$

G.  $(16a - 5)(4a - 25)$

H.  $(16a + 5)(4a - 25)$

16. Completely factor using the forms for perfect square trinomials.  $4w^2 - 20w + 25$

A.  $(2w - 5)(2w - 5)$

B.  $(4w - 5)(w - 5)$

C.  $(5w + 2)(5w - 4)$

D.  $(2w + 5)(3w + 5)$

E.  $(2w - 5)(3w + 5)$

F. Not factorable. This trinomial is prime.

G.  $(2w + 5)(2w - 5)$

H.  $(2w - 1)(2w + 25)$



17. Factor the polynomial by grouping.  $py + p\beta + 6y + 6\beta$

A.  $(p + y)(6 + \beta)$

B.  $(p - 6)(y + \beta)$

C.  $(\beta - 6)(y + p)$

D.  $(p + \beta)(y + 6)$

E.  $(y + 6)(p + \beta)$

F.  $(y + 6)(p - \beta)$

G.  $(\beta + 6)(y + p)$

H.  $(p + 6)(y + \beta)$

18. Factor the polynomial by grouping.  $48\alpha^2 + 6\alpha p + 8\alpha + p$

A.  $(8\alpha + 1)(6\alpha + p)$

B.  $(6p + 1)(8\alpha + p)$

C.  $(6\alpha + p)(8\alpha + p)$

D.  $(6\alpha + 1)(8\alpha + p)$

E.  $(6\alpha + p)(8\alpha + p)$

F.  $(6\alpha + p)(8\alpha + p)$

G.  $(8p + 1)(8\alpha + p)$

H.  $(6\alpha + p)(8\alpha + p)$

19. Solve the equation.  $56t^2 - 76t + 24 = 0$

A.  $t = \frac{3}{4}$  or  $t = \frac{1}{5}$

B.  $t = -\frac{6}{7}$  or  $t = -\frac{1}{2}$

C.  $t = \frac{4}{3}$  or  $t = \frac{3}{4}$

D.  $t = -\frac{3}{4}$  or  $t = -\frac{1}{5}$

E.  $t = -\frac{1}{2}$  or  $t = -\frac{5}{3}$

F.  $t = -\frac{4}{3}$  or  $t = -\frac{3}{4}$

G.  $t = \frac{6}{7}$  or  $t = \frac{1}{2}$

H.  $t = \frac{1}{2}$  or  $t = \frac{5}{3}$

20. Solve the equation.  $30u^2 - 28u - 16 = 0$

A.  $u = \frac{1}{2}$  or  $u = -\frac{4}{7}$

B.  $u = \frac{1}{2}$  or  $u = \frac{4}{7}$

C.  $u = \frac{5}{8}$  or  $u = \frac{1}{2}$

D.  $u = \frac{5}{8}$  or  $u = -\frac{1}{2}$

E.  $u = \frac{4}{3}$  or  $u = \frac{2}{5}$

F.  $u = \frac{4}{3}$  or  $u = -\frac{2}{5}$

G.  $u = -\frac{2}{5}$  or  $u = 7$

H.  $u = \frac{2}{5}$  or  $u = -7$

## Answers

1. D.

2. E.

3. F.

4. A.

5. A.

6. F.

7. E.

8. B.

9. B.

10. E.

11. G.

12. B.

13. E.

14. C.

15. E.

16. A.

17. H.

18. D.

19. G.

20. F.