

5A.1 Revision

Do NOT use a calculator

Marks available : 100

PART ONE

Question 1

Find the value of the following sums,

(i) $(-3) + 7$

(ii) $(-6) - (-5)$

(iii) $(-3) \times (-6)$

(iv) $\frac{(-12)}{(4)}$

(v) $\frac{(-9)}{(-3)}$

(vi) $\frac{(16)}{(-8)} + (-3)$

[6 marks]

Question 2

Write each of the follow numbers, which are in index form, as ordinary numbers without any index.

(i) 2^5

(ii) $8^{\frac{1}{3}}$

(iii) 4^3

(iv) 131^1

(v) 7^{-1}

(vi) 1^{57}

(vii) 9^{-2}

(viii) 67^0

(ix) $16^{\frac{1}{2}}$

(x) $25^{\frac{3}{2}}$

[10 marks]

Question 3

Simplify the following, giving your answer in index form;

- (i) $2^7 \times 2^8$ (ii) $\frac{11^{13}}{11^{-5}}$
- (iii) $\frac{5^8}{5^2}$ (iv) $(3^7)^{10}$
- (v) $13^4 \times 13^5$ (vi) $(7^5)^{-3}$

[6 marks]

Question 4

Given that $a = 3$, $b = 10$ and $c = -2$, evaluate the following,

- (i) $b + 2a$ (ii) $a^2 b$
- (iii) $5b - 3c$ (iv) $\frac{b}{a - c}$

[8 marks]

Question 5

Simplify the following algebraic expressions,

- (i) $7x + 3x - 4x$ (ii) $5(h - 4) + 12$
- (iii) $7x - 4y - 3x - 8y$ (iv) $2x^5 \times 5x^3$
- (v) $4(u + 6) + 9$ (vi) $\frac{10m^9}{5m^{-2}}$

[6 marks]

PART TWO

Question 1

Write in prime index form, p^m , for some prime p and some integer m .

(i) $7 \times 7 \times 7 \times 7 \times 7$ (ii) $\frac{5 \times 5 \times 5 \times 5 \times 5 \times 5}{5 \times 5}$

(iii) $\sqrt{3 \times 3 \times 3 \times 3 \times 3 \times 3}$ (iv) $\frac{13 \times 13 \times 13}{13 \times 13 \times 13 \times 13}$

[4 marks]

Question 2

Write in prime index form, p^m , for some prime p and some integer m .

(i) $7^6 \times 7^8$ (ii) $5^7 \times 5^3 \times 5^6$

(iii) $13^8 \times 13$ (iv) $\sqrt{17^8}$

(v) $\frac{11^9}{11^4}$ (vi) $(19^4)^6$

(vii) $5^8 \times 5^0$ (viii) $\frac{7^5}{7}$

[8 marks]

Question 3

Write in index form;

(i) $7 \times 5 \times 5 \times 7 \times 7$

(ii) $\frac{5 \times 2 \times 2 \times 2 \times 5 \times 5}{5 \times 5}$

(iii) $\sqrt{3 \times 3 \times 3 \times 3 \times 23 \times 23}$

(iv) $\frac{17 \times 13 \times 13 \times 13 \times 13 \times 13}{17 \times 13 \times 13 \times 13}$

[4 marks]**Question 4**Write in prime index form, p^m , for some prime p and some integer m .

(i) $3^5 \times 3^4 \times 3^2 \times 3^6$

(ii) $13^7 \times 13^3 \times 13^0$

(iii) $17^8 \times (17^5)^5$

(iv) $\sqrt{11^8 \times 11^{10}}$

(v) $\frac{(5^6)^3}{(5^2)^4}$

(vi) $(29^8)^{\frac{1}{2}}$

(vii) $\sqrt{\sqrt{7^{20}}}$

(viii) $\left((5^3)^4\right)^3$

[8 marks]

Question 5

Simplify;

(i) $p^{15} \times p^5 \times p^2 \times p^8$

(ii) $\frac{p^{17}}{p^5}$

(iii) $(p^4)^5 \times p^3$

(iv) $\sqrt{p^6}$

(v) $\frac{(p^{16})^2}{p}$

(vi) p^0

(vii) $\left(\frac{p^{19}}{p^{11}}\right)^2$

(viii) $p^8 \div p^2$

[8 marks]

Question 6Write in prime index form, p^m , for some prime p and some integer m .

(i) $\frac{1}{5 \times 5 \times 5}$

(ii) $\frac{7 \times 7}{7 \times 7 \times 7 \times 7}$

(iii) $\frac{1}{13}$

(iv) $\frac{11}{11 \times 11}$

[4 marks]

Question 7

Write in prime index form, p^m , for some prime p and some integer m .

(i) $11^7 \times 11^{-3}$

(ii) $5^{-7} \times 5^3$

(iii) $19^{-8} \times (19^4)^5$

(iv) $\sqrt{11^{-26}}$

(v) $\frac{5^7}{5^9}$

(vi) $\frac{11^{-23}}{11^5}$

(vii) $\frac{(7^5)^3}{(7^6)^4}$

(viii) $23^{-8} \times 23^{-7}$

[8 marks]

Question 8

Write in prime index form, p^m , for some prime p and some integer m .

(i) $\frac{2^8 \times 2^7}{2^6 \times 2^3}$

(ii) $\frac{2^{14} \times 2^{-5}}{2^4 \times 2^2}$

(iii) $\frac{2^3 \times 2^6}{2^{-4}}$

(iv) $\sqrt{\frac{2^{-23}}{2^{-5}}}$

[4 marks]

Question 9

Simplify;

(i) $p^{13} \times p^{-3} \times p^7 \times p^{-2}$

(ii) $\frac{p^{-14}}{p^4}$

(iii) $(p^{-4})^5 \times p^{13}$

(iv) $\sqrt{p^{-56}}$

(v) $\frac{(p^{16})^{-2}}{p^{40}}$

(vi) $\sqrt{p^2}$

(vii) $\left(\frac{p^{19}}{p^{-11}}\right)^2$

(viii) $(p^{-5})^{-8}$

[8 marks]

Question 10

Simplify;

(i) $7 \times p^3 \times 6 \times p^7 \times p^{-8}$

(ii) $\frac{16 p^{10}}{8 p^2}$

(iii) $(2 p^5)^7$

(iv) $\sqrt{49 p^{16}}$

(v) $\frac{5 (p^{0.5})^{-8}}{p^4}$

(vi) $\sqrt{9 p^2}$

(vii) $\left(\frac{18 p^{-9}}{6 p^{-5}}\right)^2$

(viii) $(0.5 p^{-3})^{-2}$

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Teachers may obtain detailed worked solutions to the exercises by email from mhh@shrewsbury.org.uk